MAGAZINE

Airborne

NUMBER 101
September - October 1990
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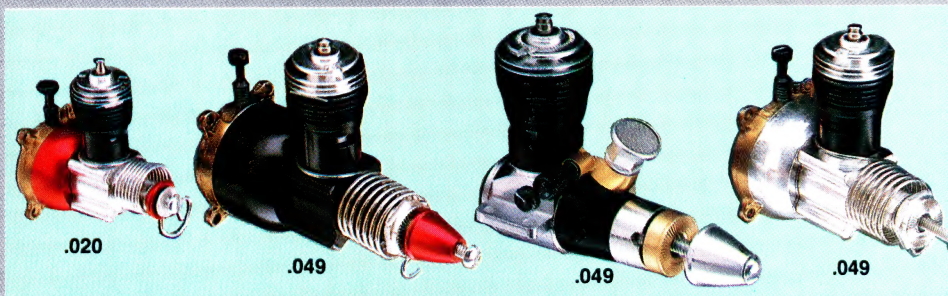
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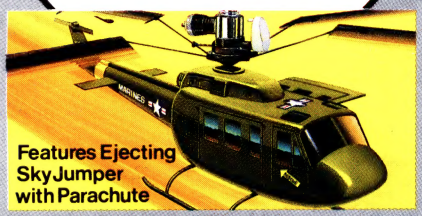
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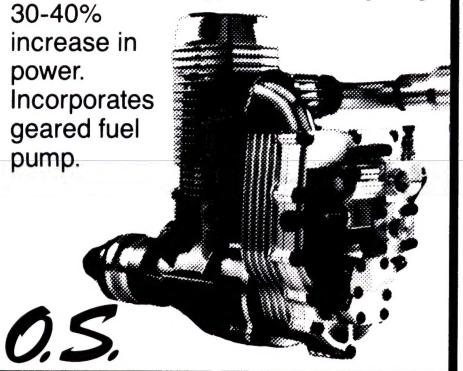
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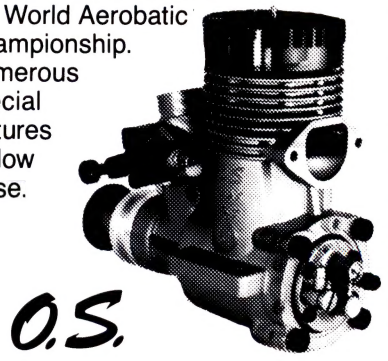
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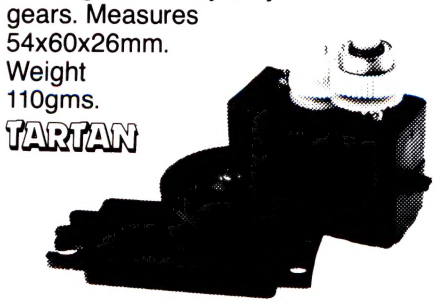
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MODEL ENGINES

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This is the balsa tree, Ochroma pyrimidale or Ochroma lagopus. It is about 40 ft high with a trunk diameter of about 2 feet, and the leaves are large; about 18 inches across. The photo was sent from Ecuador by Bub Borman, a modeller who uses mahogany for his 1/32 scale models! There is an article about balsa and other modelling woods in Aeromodelling Digest 1990.



Jerry Slates about to launch his OD wingeron-equipped soarer on its maiden flight. It flew beautifully in marginal lift conditions. Photo from Bruce Abell. More about the US soaring scene in Bruce's column.



Marcia Merrifoeld of the Melbourne Heli Club poses with her Zenith 40. Marcia covers the rotor blades with floral contact, and sports a pink ribbon on the tail boom! A very competent flyer. Photo from Wally Stern.



Ferdi Gale of SAM Italia, Chapter 62, with two T412s, the Italian Wakefield of 1942 designed by Enea Torielle, then of Milan. Ferdi has produced a small book of Italian vintage power models, reviewed in FOTS.



Bill Brichter with a well worn Bronco, the Rockwell OV 10D. At Military Day for the Noarlunga club, November '89. Two OS 20 4-strokes provide the power. That weathered finish is done in auto acrylic lacquer and Humbrol enamel. Don Howie took the pic.



Vic Clark flew this enlarged glider in the inaugural SAM Champs RC glider at Canowindra. Handsome model.

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CONTENTS

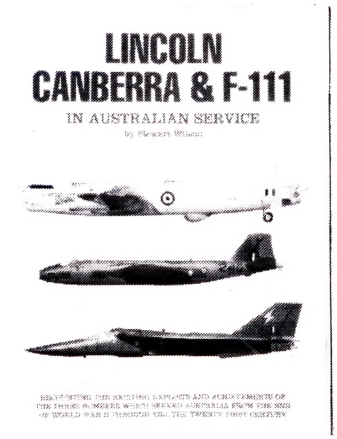
From the Cockpit....7
Letters to the Editor....9
Focus on RC; by Mel Gillot....13
SANWA'S Space PCM Radio....16
Aerial Photography....19
Engine Review: Super Tigre S29K....21
The AIRBORNE Engin-ear; by Brian Winch....27
Engine Review: Enya 80XF....30
Test Report — HAMG Shing Drill — by Brian Winch....32
Electric Flight; by Phil Stevenson....37
X-Wing Interceptor....39
Gull 1900....41
For Old Timer Sake; by Colin Borthwick....45
On Silent Wings; by Bruce Abell....49
Gumnut Models; by Jaime Herder & Ron Neve....52
Flight Analysis; by Martin Simons....58
Fantails; by Russell Weir....60
Pylon Roundup; by John Hughan....64
To Be A Modeller; by Vin Masters....68
Rotor Roundabout; by Max Tandy....72
Classifieds....10, 76
MAAA News....77
New Zealand Notes....87
Free Flight Topics: by Merv Buckmaster....88
Engine Review: OS 40 FP-ABC....90
Control Lines; by Ivars & Maris Dislers....94
Wind and Water; by Iain Kirley....97
The Marine Scene....100

COVER STORY Ernst (Ernie) Egan of Model Design, Adelaide, shows off his new design — SUKHOI SU-26. The kit features epoxy glass fuse., complete with panel lines and rivets, epoxy glass undercarriage, foam wings, rudder and tailplane. Power is from an Enya 120R wearing a Model Design 3 blade prop. Radio is a JR Century 7, using 4 channels.

ADVERTISERS' INDEX

ABC Models....11
Aerofan....86
Aerospace Publications....6
Australian Hobby Centres....62, 63
Australian Model Aerodrome....48
B&D Model Trading....101
Balus Products....93
Bardon & Munday....26, 66
Basham Models....80
Bolly Props....15
Brian Bourke Enterprises....42
Bryzen Hobbies....12
Bundaberg Hobbies....42
Castle Hill....18
Control Tower....47
Custom Composites....83
Dawn Trading....46, 47
Dax Model Engines....32
D.R. Batteries....40
Electric Wings....48
Emco Machine Tools....59
Finescale....91
Fliteline....59
Futaba....85
Hawthorn Hobbies....42
Hobby City....70, 71
Hobby Gear....86
Hobby Hangar....44
Hobby Headquarters....34, 35, 36
JM Innovations....84
Kelletts Hobbies....24, 25
Kenneally's Imports....44
Kraft Systems....14, 22, 43, 61, 89
KTronics....66
Kyosho....103
M.A.A.A....78, 79,81
Magnum Model Products....55
Model Design....83
Model Engines....OBC, 3
Model Power....93
Moore Park Models....43
Mr Plywood....51
O'Reilly, Leo....29
Owen Engines....93
Owen Delta Engines....93
Pricerite Engineering....73
Princeton Books....20
Radio Control Services....45
Radio Control Supplies....33, 91
RC Helicopter Australia....74, 76
RJ Model Enterprises....86
Rowes Hobbies....20
Russell, Frank....101
R.W Hobby Distributors....61
Savaris, Victor....45
Scale Aviation....80
Scalecraft....40
Scale Model Research....55
Schmidt, HJ....80
Southern Models....2
Southern Sailplanes....55
Speedline....38, 42
Toyman Imports....40
Trim Aircraft....80
VFFS....89
Williamstown Hobbies....54
Wings 'N' Things....67
Wooden Warship....92
X-Cell Products....89, 101







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From the Cockpit

The USAF's F117 or Stealth Fighter. Can you believe that this is real? Surely the weirdest aircraft ever designed! Has anyone seen a 3-view? Who will be first to build a model of it? Would-be scale modellers please don't read Flight Analysis! This pic is from the cover of Aircraft magazine, June 1990, reproduced with permission. Whooo eeee! Don't anybody say it's beautiful!

The Editor's Pot Pourri of replies and comments.

A MODE FOR ALL

Following the description of RC Control modes in TBAM in No. 99, I discussed Vin Master's description with Tom Prosser, who pointed out that choice of mode should depend upon the right-handedness of the pilot. In brief, those who, like me, are strongly right-handed (due to strong dominance of the left cerebral hemisphere in the brain), can be comfortable with both primary RC controls (elevator and aileron) on the same, RH, stick. For many other pilots, who have some ambidexterity, it can be easier to have the primary controls on separate sticks. The usual way is elevator on the left, and aileron on the right; then rudder is on the left and throttle is on the right; which is Mode 1. For left-handers, try Mode 2 reversed. To see how good you are, try flipping the reversing switches on the Tx!!

40th ANNIVERSARY

The Newtown Model Aeronautical Association was formed at 604 Stanley St., Wooloongabba, Brisbane, on 19 July, 1950. The address was that of Arthur Gorrie's famous model shop, and that urbane and august gentleman modeller was the catalyst that brought the Association into being.

The club and its members supported mainly the activities of the MAAQ, but many of those members were (are) from the other states, such was the enthusiasm and diplomacy of Mr. Gorrie. For example, the Editor was inducted into the NMAA membership, unaware that his contribution to modelling in Queensland had been noticed! Arthur is one of modelling's Quiet Achievers, except when given the opportunity for public speaking!

ANNUAL MILITARY SCALE RALLY

Conducted by Noarlunga District Radio Modellers, 25 November, 1990.

ANOTHER TURBO JET

The April-May & June-July issues of Strictly I.C. have a two-part article about a miniature turbo jet designed and built by Bryan Seegers of Arizona. It produces 15 lbwt of thrust at 82,000 rpm for a weight of 7 lb. The exhaust gas gets up to 1450°F. Strictly I.C. was advertised in No. 100.

CONTACT .....

..... Port Pirie MAC, Secretary, Anita Koenig, 12 Keith Street, Port Pirie, SA, 5540. President is Bob Steer.

..... Sydney RC Helicopter Club, secretary, Julian Clutterbuck, 37 Marshall Road, Telopea, 2177; or phone (02) 808 0999 during working hours.



Pictured at the opening of the new Knox MAC clubhouse, built with a generous grant from the Knox City Council, are KMAC President Ian Ferris, Terry Mathews with his Fireball replica, and Knox Mayor, Councillor Hurtle Lupton. Bad weather on the day reduced the Fireball contest to static judging only. Photo from Derek Pickard.



This is a leaf of a small balsa tree. The hand that is holding the leaf still for the photo shows that it is about 18 inches across. The spots on the leaf are insect and mold damage. The photo came from Bub Borman in Ecuador. The Digest with the balsa story is not available from Airborne, but from Samaria Concepts, RMB 1798, Benalla, Vic., 3673.

† TIM HERVEY

In his obituary in Aeromodeller, Ron Moulton declares that Tim Hervey was one who trod on enchanted ground. The enchantment he passed on to all those who came to know him.

He started modelling at about 12 years of age, direct inspiration coming from the Wright brothers, Bleriot and others. He was apprenticed to the Bristol Aeroplane Co. at 19, joined the RFC, eventually becoming a fighter pilot in WW1, serving with Ball and Bishop. He was shot down and captured. He escaped and was recaptured a couple of times, and emerged from the conflict with an MC and bar.

He moved to Australia to fly as a commercial pilot with Ross-Shaw Aviation, formed Central Aviation, and designed many model aircraft that were published in Aircraft magazine. He was a founder member of the Gliding Club of Victoria, and returned to England to become manager and CFI of the London Flying Club in 1936. He then joined the RAF and served with MI9 during WW2, also being in command of glider training.

He was then asked to become manager of Eaton Bray, and so he resumed modelling and gliding, providing leadership and technical guidance in everything he did. The Model Drome was a dream that did not last, being over-run by Heathrow, but the modelling expertise of the Eaton Bray team, including Tim Hervey, started the long story of MAP.

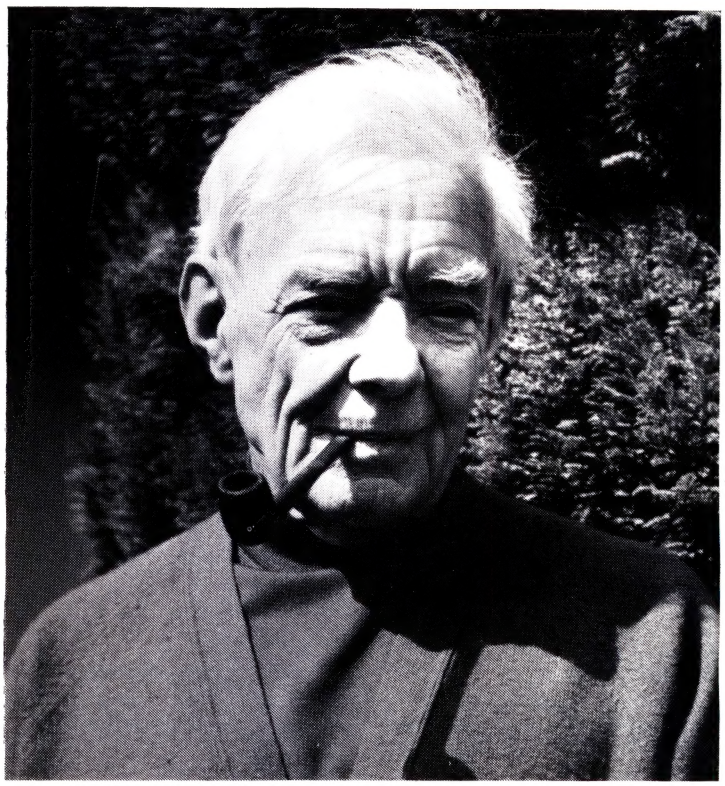
His modelling skill was exquisitely displayed in an artistic manner in his miniature birds and animals made from plant fibres, seeds, bark and other natural materials. Exhibitions of them gained him recognition and Royal patronage.

He continued flying in hot air balloons with the London Balloon Club which he helped to establish, and relinquished his licence only at 90 years of age. He enjoyed modelling as a spectator at Old Warden, and kept up an international correspondence to the very last.

To most Airborne readers, Tim Hervey belonged to the past, but his brilliance, combined so well with such a gentle nature and steadfastness, belong also, I hope, to the future.

M.B.

Thanks to Ron Moulton, Bob Miles, Charles Lambeth, Jim Fullarton, Martin Simons and others for help with this item. A more detailed article by Martin appeared in AIRBORNE No. 54, Nov.-Dec. 1982.



Hamilton Elliot Hervey, January 1990. In Australia he was called Ham, and to his many friends worldwide he was known as Tim. He was interested in model aeronautics since 1906, longer than the lifespan of most men and women. Tim sent this photo to the Editor only weeks before he passed away.



John Marquette with Cicada in the early days of radio control.

VALE JOHN MARQUETTE

John Marquette died on 6th August 1990. Not only did John enjoy a little more than his promised three score years and ten, he lived them in excelsis.

John's early years were the Depression years, ameliorated by loving parents. War came and, like most of us at that time, John volunteered. He flew his beloved 'Span-Cans' in several operational theatres - the Middle East, Italy, Germany, finding a brief time to marry his cherished Nan. Our thoughts go to her, to daughter Lee and sons Anthony and John junior; to them and theirs.

Like so meny Air Force men, John had been a modeller. Came the peace and he became an even more enthusiastic one, eventually producing Australia's first commercial RC set, the Silvertone. As a giver, not merely a taker, John became President of the NSW Aeromodellers' Association.

In the mid-fifties, John and I had a vision - a vision of modellers owning their own flying fields. We needed two hundred others at £45 each, to buy ninety acres at Camden, then for sale at £100 per acre. It would have ment the price of about three packets of cigarettes each per week for two years. We couldn't find them, and I lost the vision. John didn't lose his. A few short years later Leo O'Reilly came to Sydney and told John what Constellation Club had done. John soon gathered to himself eighteen others of like mind, including Leo himself, Russ Hammond, Bob Wallace, John Tuckett, Basil Healy, Ross Woodcock ....

It is sed of Christopher Wren "Si monumentum requiris circumspicere. " If you want to see John's monument, invite yourself out to the SMAF field at Pitt Town. While ever modellers continue to fly models, John Marquette's monument is vouchsafed. Would that others might one day say the same of me.

Ivor F, VH1

I first met John at the Camden Model Aircraft Nationals in 1958. He was innovative, inventive and, as he recently said to me, his worst trait was that he was a perfectionist. Whatever John did he did well. He was a manufacturer of model aircraft radio equipment, a model designer, competitor, record holder, judge, administrator, Australian team manager, magazine columnist, State President, President of the Radio Control Model Club, and formed the Sydney Model Aircraft Pty Ltd, a company which purchased 17 acres of land at Pitt Town for a flying field, a first in Australia. John was a recipient of the Australian Aeromodellers Hall of Fame award, and also the Valley Radio Flyers Shepparton achievement award. He flew a model across Port Phillip Bay from a helicopter in 1961. He, together with the Model Aircraft Radio Control Society, was responsible for the yearly Wagga Championships. In the mid '70s, John and Lyall Winley managed to separate RC from FF and CL in the NSW association, with notable success, although breaking with tradition.

I'm proud to say that John was my flying buddy. Ian Watts

Letters to the Editor

Readers' Forum

Have your say!

Dear Sir,

Mel Gillott's review of the Thunder Tiger Super Mosfet Power Panel (Airborne 100, p. 11) contains an unfortunate technical error relating to the measurement of current in the glo plug. As stated, the TTSMPP uses "rapid pulses" to heat the plug, and such pulses cannot be accurately measured with standard meters, digital or otherwise. Standard meters will indicate the average value of the current, while it is the RMS value that is responsible for heating things like glo plugs.

A special "true RMS" type of instrument must be employed in cases of pulse currents, and if this is done then the same value as for steady currents is obtained for equal temperatures of the plug's coil. The increase in efficiency claimed by Mel is, therfore, imaginary.

There is no doubt that MOSFETS are more efficient and reliable than ordinary transistors, making the new TTSMPP a better design than its predecessors, but not by the factor suggested.

There is, however, much to be said for the single nicad cell driving glo-plugs, as this is inherently 100% efficient and has a steady voltage, something notably lacking from most electronic glo drivers.

Yours faithfully,
Phil Allison, Summer Hill, NSW

Dear Sir,

I have recently inspected the new Sheppartor flying field which has been purchased by the 'Goulburn Valley Flying Field Co-operative Ltd'. I suppose one always gets preconceived ideas about what something is going to be like, and when it comes to flying fields I must admit some pessimism is generally apparent in my approach.

Well, the new Shepparton field is just magnificent, and better than I could ever have imagined. It is approx 70 acres in area, rectangular in shape and surrounded by attractive open, lightly timbered country. It is bounded by roads on two sides and has near-new fencing and gates. There is a grove of mature gum trees and a large dam which will provide ample water for irrigation. The gum trees cover a grassed area and provide an idyllic shelter and picnic area. The entire area is absolutely flat, and was previously used for both grazing and crops.

The night before I saw the field the area had 25 points of rain but we had no trouble in driving to the middle of the field, and very little surface water was apparent. The surface is so good that one could fly any sort of model off it right now without any preparation. The locals advise that sweet bore water is available at 3 metres so, coupled with the large dam, ample water will be available. Think about a lush green strip and picnic area all year round.

Because of its very large area, flying strips can be set up any way you like, but in this case a southerly aspect can be used to enable flying with the sun at your back. Keeping in mind its unimproved state, the field is as good as Cardinia in some respects, and better in others.

When it is improved and the plans that the Valley Flyers have for it take shape, it will become a unique and near-perfect mecca for model flying, and will undoubtedly be visited by modellers from all over Australia. The system of operation and tenure is a co-op, and I understand that some shares in the property are still available. Although one does not visualise or expect a project of this type to be a purely money-making venture, it is without doubt a gilt-edged security investment for the future. Any modeller who wants a share of a super flying site with ready access to the beautiful city of Shepparton should not miss out on this opportunity.

In conclusion, I should add that low drift free flight is also possible, and I for one will be using this beautiful field for that purpose.

Yours faithfully,
Norm Bell (North Balwyn, Vic.)

An opening ceremony and fly-in is planned for the first weekend in November, with special events and catering to make all visitors welcome.



This is the Hi-Tec Headquarters and distribution centre in San Diego, California, opened in April and managed by David Abbe, well-known RC pilot and columnist. Hi-Tec of Korea has ended its association with Aristocraft of America, has expanded its factory and activities in Seoul, is producing upgraded radio sets, commencing with the Master series, and its quality and service continue to be outstanding. This photo from Australian Hi-Tec agents, Model Engines.

Dear Sir,

I feel that I must put pen to paper over one of Martin Simons' remarks in his concluding article in Airborne No. 100. I have the greatest regard for Martin, and have thoroughly enjoyed his articles and will sorely miss them in future issues.

However, he has once again strongly condemned the use of the terminology in common use, which describes airfoils as "flat bottom", "undercambered", semi-symmetrical" and "symmetrical"! **In theory** he is absolutely correct, but to describe an airfoil as having a 3% camber is meaningless unless a lot of other data is given to supplement this statement; e.g. 3% camber on a 15% thick section is a very different looking airfoil from a 3% camber on an 8% thick section. Similarly, changing the position of the high point of the camber line also makes a marked difference to the section, as does flattening the front portion of the camber line (high nose entry section) or the rear (reflex section). The old terminology in common use is, although **technically** incorrect, a far more descriptive method of verbally describing an airfoil section, and I'm afraid that it will continue to be used by aeromodellers everywhere until such time as an acceptable, alternative, technically correct method is developed and aeromodellers are re-educated in its proper use.

In closing I would like, on behalf of the readers of Airborne, to say "Thanks, Martin, for a great series! We'll all miss you."

Yours faithfully
Bruce Abell

On Martin's behalf, may I point out that the most important feature of an aerofoil is its camber, although thickness, high point and nose radius do matter. It is not important if it is convex (symmetrical), plano-convex (flat) or concave (under cambered) on the bottom surface! Furthermore, Martin's exposition of the correct terminology, which you recognise, is the technically correct method of describing aerofoils for which you are looking, and Martin has done more than any other author to re-educate aeromodellers. Not to worry Bruce! The new breed of pilots will cope with new terms quite well. Meantime, let's go fly and have fun!

Dear Sir,

There has been some talk about the new Aeromodelling Digest, and I noticed an advertisement in the last issue of Airborne. Just what is the Digest all about, what does it have for modellers and how does it fit in with this magazine?

Yours faithfully,
C. Lyon, Tooronga, NSW.

The Aeromodelling Digest has been produced by a company which has no connection with Airborne, except for using the same Editor. The Digest contains 176 pages, about A5 size, with a stiff cover. There are 24 articles, similar to feature magazine articles, and several brief items. The articles deal with modelling materials, engine production, thermals, unusual aircraft, aerial photography, modellers of 40 years ago, mufflers, setting up a new flying field, aerodynamics and

model aircraft records. Each one provides interest and a reference source of information that will serve for years to come.

There are 11 construction articles with plans, dealing with vintage free flight, RC sport, electric powered soarers and CL speed models. There are several other 3-views to provide information about electric models from basic to advanced designs. One article deals with 130 scale rubber model plans. All plans are available as indicated in the Digest.

This is a book that will be read and re-read over many years: it is not a magazine that deals with the contemporary scene and soon becomes dated. One pleased modeller likened it to the Aeromodeller Annuals.

To keep the price down, Aeromodelling Digest is not available from newsagents or hobby shops, but only from the publishers, Samaria Concepts, at RMB 1798, Benalla, Vic., 3673. At $15 (about the cost of 3 glow plugs!) this is good value. And for the many Airborne readers who would like the magazine to be produced every month, this publication should provide something to read in the gap between magazines.

Dear Sir,

Thank You for that absolutley splendiferous copy of AEROMODELLING DIGEST 1990! It is absolutely the best book of this nature that I have ever seen, Merv. You have something in there that will appeal to modellers in every sub-field of aeromodelling. There is a large amount of information in those pages that I want to savour.

The only article I have fully "digested" is yours on dihedral. Plane geometry defines dihedral angle as that angle between two intersecting planes measured along a line drawn perpendicular to the line of intersection. If you build a 102 inch wing with 9 inch dihedral under each tip, calculators say you are building a wing with 10 degrees of dihedral. The measurement should be made between the two planes, in accordance with the NACA and Euclid's definition, and would be 170 degrees!

On page 147 you prefer the use of 'longitudinal dihedral' to 'decalage' when speaking of the difference of incidence between the wing and the horizontal stabilizer of a flying machine. Although I have never heard your preference on this side of the world, I was immediately struck with the fact that the difference DOES produce the effect of longitudinal dihedral even though the wind blows in a funnny direction! Being of an evaluative disposition, I struck down the possibility that such things happen on the bottom of the earth, where both John Pond and Eut Tileston have assured me that the blood did not rush to their heads because they were walking around upside down. See, I am willing to throw away misconceptions. Also, you state 'decalage', when used properly, only pertains to the difference of incidence between the wings of a biplane. I concurred with the biplane application, but believed the word usage was also correct for the wing-stab version. It can be argued that downthrust, some incidence of the stab and a rearward position of the stab could all be lumped under 'longitudinal dihedral'. In fact, if NACA had substituted 'horizontal surfaces' for 'lifting surfaces' or 'wings' in the definition, there probably would be no problem in tolerating a wing-stab decalage!

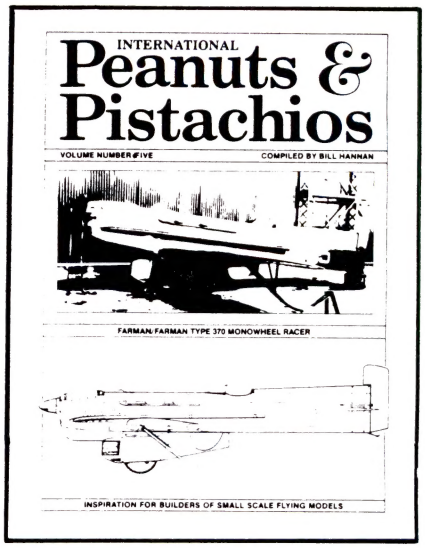
In summation, I guess it really doesn't matter if one refers to a wing-stab decalage as longitudinal dihedral. The important point is to be familiar with each of the above and be able to use them all properly, efficiently and with vigour! Being lazy, I prefer to use 'decalage', and will invite confusion only when I am referring to a bipe. Then I shall say 'wing decalage' or 'stab decalage'!

Yours faithfully,

Fred Lehmberg, Anderson, California, USA

The above letter has been shortened, but illustrates the appropriate attitude to 'serious' articles in the Digest, which were prepared to provide information and provoke discussion.





PEANUTS & PISTACHIOS No. 5

After 12 months preparation, Bill Hannon's unique and exquisite series continues, with more of the mixture as before, but even better. The 28 magazine-sized pages seem to be better quality paper, and the printing is first class. The photos, letters and plans are all fascinating reading. For modellers of the miniature miniatures, this will be like manna from heaven. For other modellers the taste will be exciting and tantalising. The hints and tips will be intriguing to everyone.

If you have seen earlier P & Ps, this collection will be an automatic choice. But P & P No. 5 is also an excellent place to start one's acquaintance with these special models. It is available for US$7.95 plus $5 air mail, from Hannan's Runway, Box 210, Magalia, California, 95954, USA.

MAGAZINE Airborne

CLASSIFIEDS

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FOR SALE: Avenger II Hulls x 2, new, one with running gear, $150; OS VRM 40 Marine motor, new in box, $$250; Pica Spitfire kit, $200; Pilot Zero kit, 40 size, 90% built, $150. Phone Ken on (060) 21 8699 [BH] or (060) 21 8358 [AH]

AIRFOIL SECTIONS: Profiles generated by CAD/D software and plotted accurately on plastic film, to construct rib and foam templates. Co-ordinate data available for most published airfoils. Rib sets drawn for curved or eliptical wing plan forms. sheeting/skin thickness can be added to profiles. In the revised Girsberger family of airfoils, both thickness and camber ratios can be tailored to your requirements. Ring (067) 72 4910, Monday to Thursday, after 7.30 pm.

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FOR SALE: Engines - modern, vintage, Old Timer; most un-run; Dooling, McCoy, Mills, etc. Contact Bob Allison on (03) 51 5243

FOR SALE: One thousand English and USA model aero magazines, 1946 to 1976. Many scale model plans. Engines 1946 to 1976. Phone Nick on (070) 64 2364.

FOR SALE: Brand new Glow 15s; Three-Leaves, CS & Nelson. Phone Howard Gostelow on (03) 876 1171.

FOR SALE: JR 7 Ch. MAX computer radio, 40 MHz, Mode 1, brand new in box, includes battery pack, nicads, servos, receiver. Never used; $700.00 o.n.o. Phone K. Weiss on (02) 520 2184.

FOR SALE: Two OS 77 VR DF Engines, new in boxes, never used. Getting out of DFs; $700 the pair or $395 each. Phone Dave Burns on (02) 520 4434.

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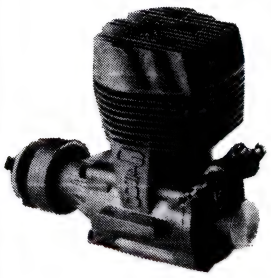
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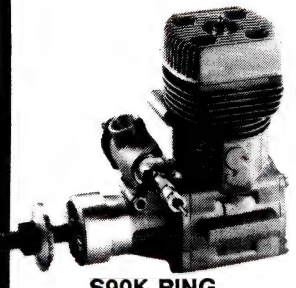
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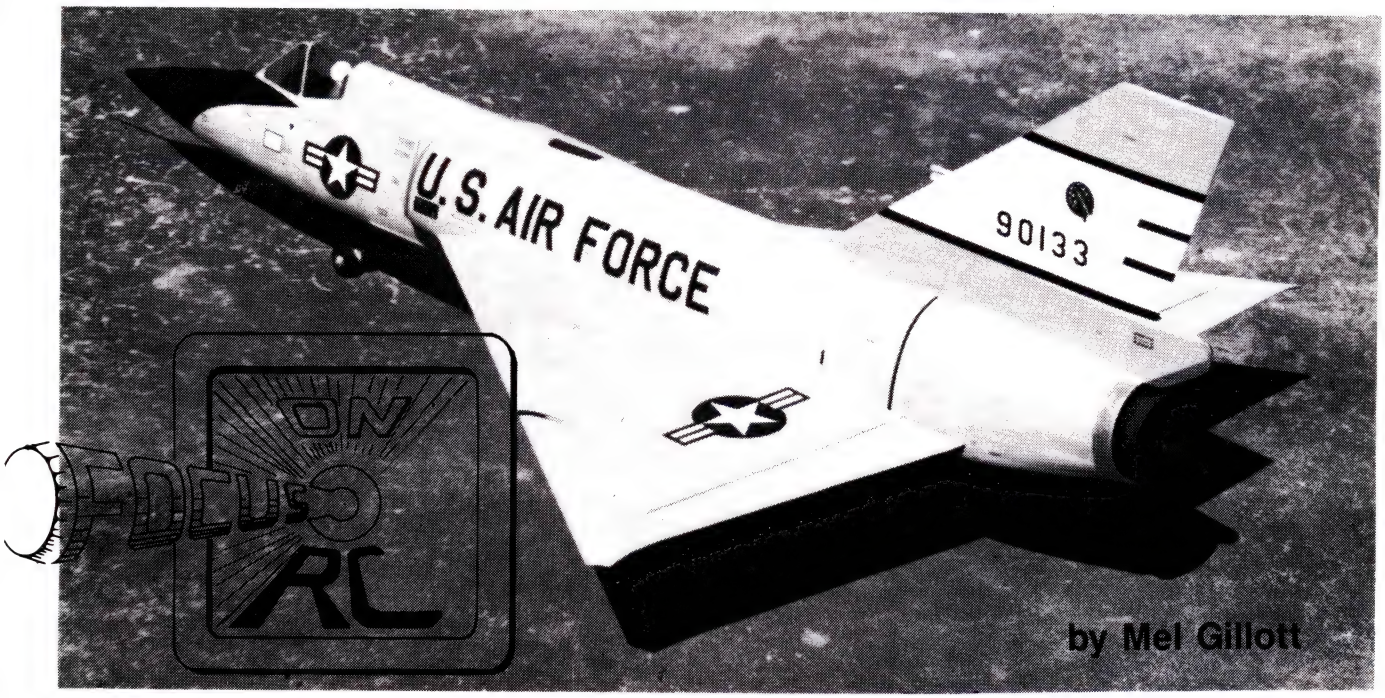
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S40 Ring FI RC & Muffler
S40 ABC FI RC & Muffler
S45 Ring FI RC & Muffler
S45 ABC FI RC & Muffler
Como 51 Ring FI RC & Muffler
Como 51 ABC FI RC & Muffler
S61K Ring FI RC & Muffler
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S3000 FI RC
S6000 In Line 60cc Twin
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G34H ABC/R & Muffler
S45H ABC/R & Muffler
S61 ABC/R FI RC & Muffler
S90 ABC/R FI RC & Muffler
S21/25/29 TIGER'S PAW Muffler
S40/45/51 TIGER'S PAW Muffler
S61/75 TIGER'S PAW Muffler
S90 Tigers Paw Muffler
S61/75 Tuned Pipe

All above engines supplied with glow plug



FOCUS ON RC

by Mel Gillott

Peter Wilson's Convair Delta Dart for whip-line flying. No. Not RC! Not even an engine! This style of flying was explained in Airborne No. 15, June 1976. No noise problems here! Model is about 3 foot long and is sheeted in 1/32 balsa. Very light for a sheeted structure.

SPRING IS SPRUNG

The weather is warming up and, hopefully, drying out, and a young man's fancy turns to more outdoor activities. Older men too, of course. There may be other things to do in the spring time, but none as wholesome as model flying. As usual, FOCUS has much to help the enthusiast pursue this wonderful activity, both from the columnist's pen and from contributors. In this issue there is a review of Sanwa's entry into the expanding computer radio market, and some more on safety, what modellers are building, plus a look at a new engine and, space permitting, lots more. But first it is over to the Editor for a brief analysis of the AIRBORNE Reader Survey.

DID YOU CONTRIBUTE TO OUR STATISTICS?

In the July-August issue last year (No. 94) the manager included a questionnaire asking for details about modellers and their modelling. The response was quite good and gave a worthwhile set of results on which the development of the magazine could be based. The replies were collated by computer, and the results became available in the middle of this year.

It could all be summed up briefly as "No surprises". In essence, the overall picture is very much as it was a decade ago when a more simple survey was done. However, there have been some interesting details brought to light in the new survey.

For example, nearly half of the modellers (who replied) are between 30 and 50 years old, although there is a good number (over 21%) in the teenage group. As would be expected, modellers come from all sorts of jobs and occupations. Modelling can be a life-long activity and most free flighters have been such for over 25 years, whereas the opposite is true for radio control flyers: about half have been RC pilots for less than 5 years.

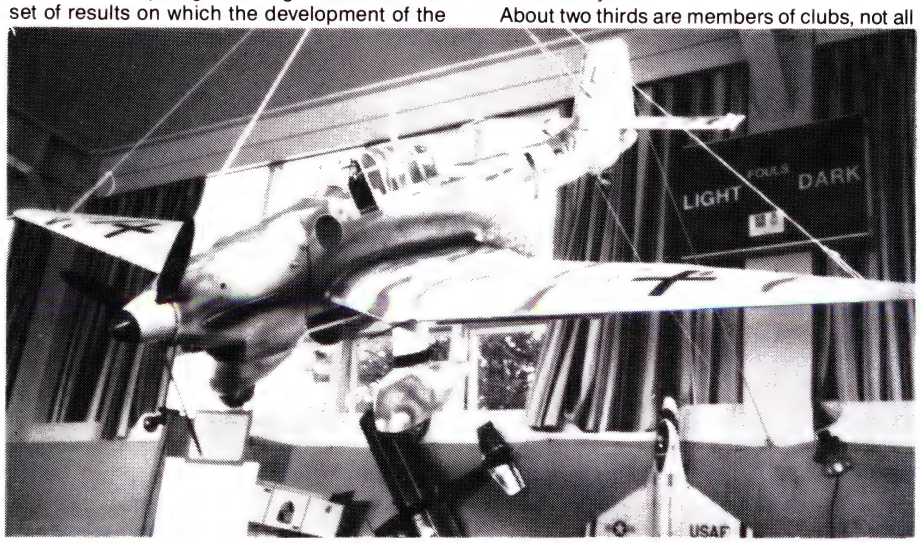
About two thirds are members of clubs, not all of which are affiliated with the MAAA. This is a very important point. It is the MAAA which has obtained for us special RC frequencies, special height clearances for approved sites (without clearance the limit is 300 feet!), government support, special modelling insurance and provides financial support for World Championship teams. It is in every modeller's best interest to belong to the MAAA. It may not appear to be doing much for individuals, but it works behind the scene and, in simple terms, makes modelling possible in this country.

Since there is a very wide range of models, the preferences of readers was interesting. General RC models topped the list by a significant margin, with free flight and RC gliders next, almost level, followed by RC trainers (isn't that everything?), control line and RC Old Timers. The very specialist types were at the bottom of the list; no surprises there! Electric powered models were well down, but their popularity last time was unmeasurable, and they will become more popular as time passes.

With the above results in mind, the popularity of the AIRBORNE columns reflects the interests. Focus is just ahead of the Engin-ear, but Flight Analysis was clearly next, ahead of gliders and Old Timers. Contest reports were way down at the bottom of the list.

Most modellers build sometimes from a kit, sometimes from a plan. Most have some radio gear. Practically everyone has engines, with the 5 cc and 6.5 cc being the most popular. Four-strokes are now widely accepted. Apparently there is considerable optimism among modellers, as more than half indicated their intention to buy new radio gear or a new engine soon.

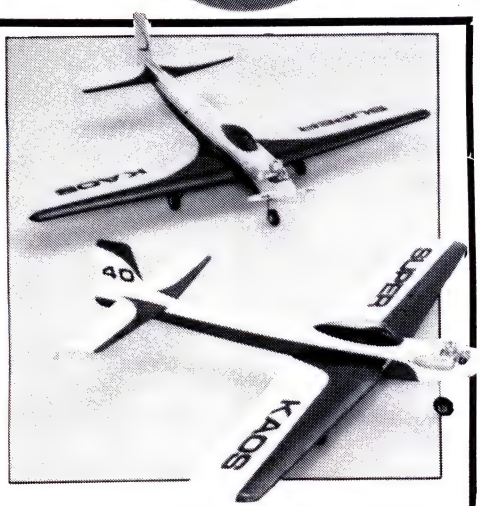
The survey asked where copies of AIRBORNE were obtained and, as part of the question, it was revealed that less than half the readers bought



David Law's Stuka, won Mammoth Scale at the Futaba Trophy and was top model at the VARMS Expo. Powered by a Super Tigre 6000 twin! Photo by Jim Robertson. Such big models need special mufflers which are more effective than stock types. Engines run at low revs reducing prop noise, and large aircraft mass absorbs or blankets airframe noise.

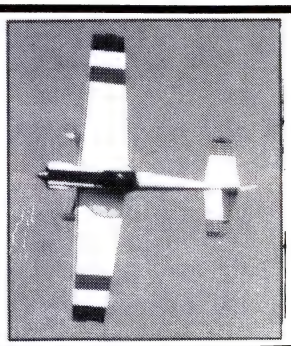
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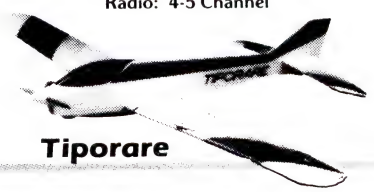


Cap 21-40
Wingspan: 60"
Engine: 2-Stroke .40-.45 or 4-Stroke .46-.60
Radio: 4-Channel

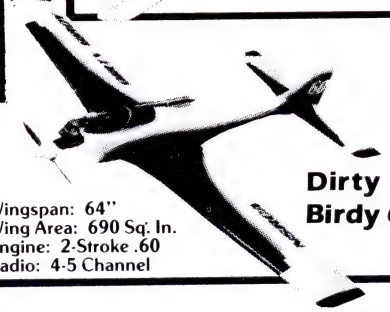
Cap 21-60
Wingspan: 72"
Engine: 2-Stroke .60-.80 or 4-Stroke .90-1.20
Radio: 4-Channel



Illusion
Wingspan: 65"
Wing Area: 750 Sq. In.
Engine: 2-Stroke .60
Radio: 4-5 Channel



Tiporare
Wingspan: 65"
Wing Area: 720 Sq. In.
Engine: .60
Radio: 4-5 Channel



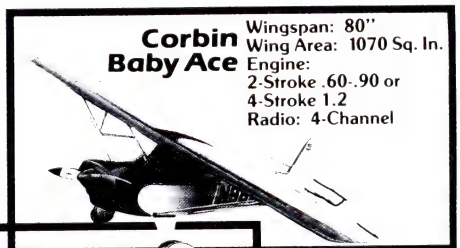
Dirty Birdy 60
Wingspan: 64"
Wing Area: 690 Sq. In.
Engine: 2-Stroke .60
Radio: 4-5 Channel



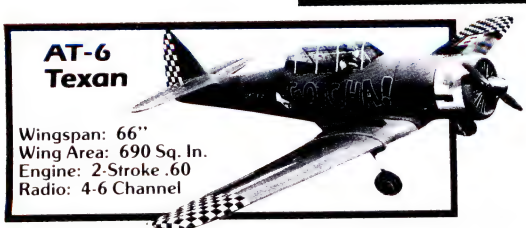
Aerocommander Shrike
Wingspan: 79"
Wing Area: 715 Sq. In.
Engine: 2-Stroke .40-.45
Radio: 4-6 Channel



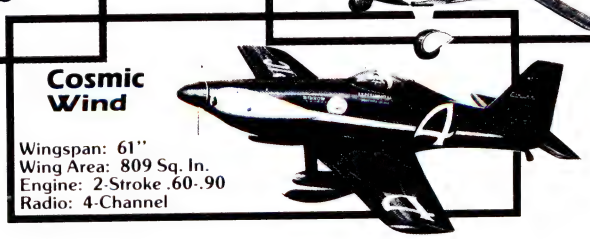
T-28D
Wingspan: 68"
Wing Area: 697 Sq. In.
Engine: 2-Stroke .60-.90
Radio: 4-6 Channel



Corbin Baby Ace
Wingspan: 80"
Wing Area: 1070 Sq. In.
Engine: 2-Stroke .60-.90 or 4-Stroke 1.2
Radio: 4-Channel



AT-6 Texan
Wingspan: 66"
Wing Area: 690 Sq. In.
Engine: 2-Stroke .60
Radio: 4-6 Channel



Cosmic Wind
Wingspan: 61"
Wing Area: 809 Sq. In.
Engine: 2-Stroke .60-.90
Radio: 4-Channel

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their own copy! Well now, come on you lot that borrow a copy! If you don't buy the magazine because you don't like it, write in and say what you would like changed. The magazine needs your support; that is buying, not borrowing! It has survived because of good support from the advertisers and because the AIRBORNE team that built it up was willing to accept less than a fair return for their efforts to keep it going. It is your own Aussie mag; support it!

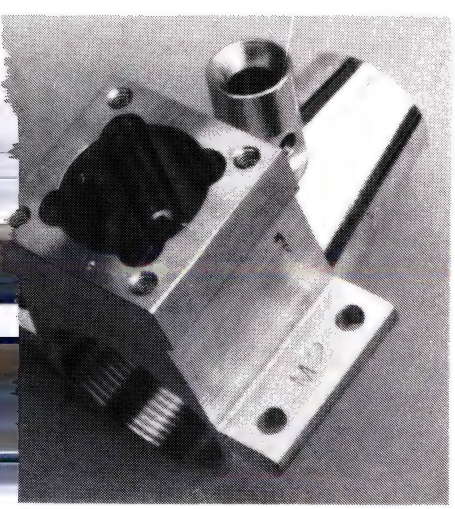
The analysis of the questions about advertising does not belong here, but it is interesting to note that most modellers shop around for every item, even buying overseas when something seems to be unavailable in this country, and the advertisements get a pretty thorough reading from most. The popularity of the ads is also reflected in the larger proportion of the magazine that they now take up. And some readers flip through the magazine from back to front!

SCALE MASTERS June 9 & 10, 1990
Valley Radio Flyers, Shepparton.
Results (15 flyers)

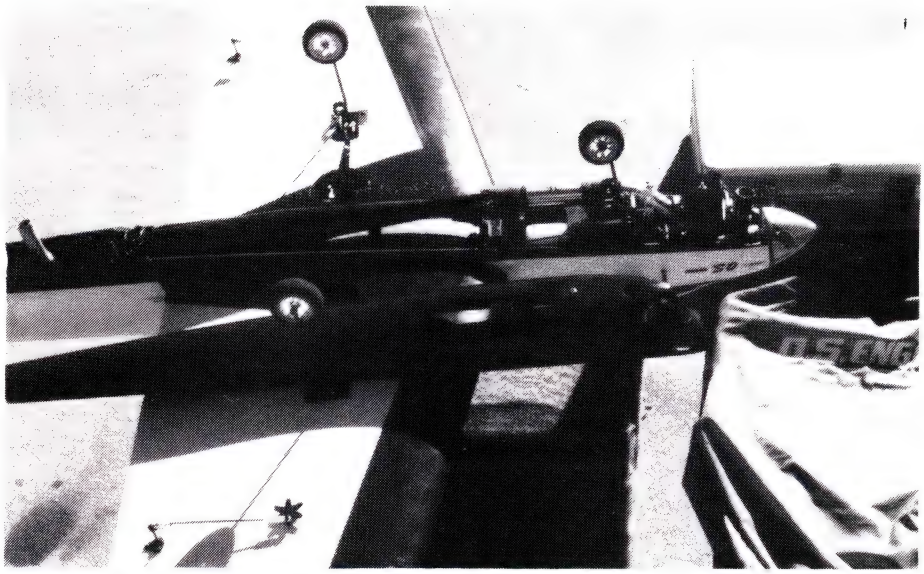
		Static	Total
David Law	Junkers Stuka	94.5	170.85
Barry James	Thunderbolt	88.5	159.65
Noel Whitehead	Pitts S2	95.0	157.55
Glen Weeks	Moth Minor	88.0	156.65
Ian Forrester	Gee Bee Y	78.0	148.65
Brian Whellan	Catalina	83.0	148.25

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M.E.C.A. MEETS
Date: Sunday 18th November 1980
Venue: Ryde-Epping MAC, Christie Park, Talavera Road, North Ryde.
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Bob Burrell (02) 419 4201



The crankcase of the Owen Delta Mate. This is what is produced from the crankcase extrusion available from David Owen, in a kit for the Mate containing all materials and instructions. The only machine tool needed is a small lathe.



Steve Coram's (or is it Neil Fraser's?) new F3A machine powered with the new OS Hanno Pretner Special. Note intake muffler and OS-Hatori long pipe. Excellent power output, and quiet with this set-up. Lite wheels and exposed aileron servo arms too. Photo from Tony Farnan.

OUT OF THE MOUTHS OF BABES
from Mark Adams

I hate making cowls from fibreglass! The job is messy, the resin smells, and I'd put money on it that the resin causes cancer. But I had to make one for the latest addition to the squadron. There I sat in the workshop, knowing what needed to be done and lacking the motivation to do it, until Minnie Mouth skipped through the workshop door, detouring on her way home from school.

"See what I made at school, daddy? It's a head for a puppet. I made it out of newspaper and glue. The teacher said it was paper mushy."

"That's papier maché, honey."

I examined her handiwork. As a puppet it would have done as a prototype for Freddy from 'Friday the 13th', but I couldn't say that.

"Gee, it's light, Love."

"Yeah, dad. It doesn't break. See!" She dropped the head onto the concrete floor. It bounced with a hollow sound that reminded me of something, but what?

"I was the only one in school who could make one, 'cause you do it just like the way I help you to make those front bits for the planes, except I used paper and glue and you use that cloth and sticky stuff."

Out of the mouths of babes! The French have been making all sorts of things from papier maché for centuries. I'd even given my wife a heart-shaped box for our paper wedding anniversary! Papier maché is tough, but light, and you only need yesterday's newspaper and some wallpaper glue.

The next day I made the cowl. It was just like fibre-glassing, except that I put down layers of glue-soaked newspaper instead of glass cloth. It was still messy, but there was no smell, and I haven't heard of paper-hangers dying of glue cancer. In a couple of days it was dry. I sealed it with dope and talcum powder. A bit of work with the sanding block to smooth it off and I had a strong, light cowl.

But don't tell my wife that I've got the wallpaper paste.

DEADLINES:
Issue No. 102 7 September
Issue No. 103 2 November

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SPACE PCM

A New Radio From Sanwa .....

As modelling moves into the nineties, our technology-loaded RC pastime is keeping abreast of new developments. Today's radio control systems give the user tremendous flexibility in the operation of the model, and at a relative price that is considerably less than in the early days. Computer driven systems have been around for a few years at the upmarket end of the sport, but now they are coming within reach of the average modeller. The **Space PCM** six channel system is Sanwa's foray into this market, and the signs are that they have a winner.

Beauty More Than Skin Deep

First impressions are very good. The transmitter is attractive and looks like a qulity instrument. More importantly, it feels good, and is ergonomically styled. I like the contoured end plates and rear grip which makes the Tx feel as if it's tailor-made. Sticks are smooth, slop free and have the usual adjustment for length, and also for tension on all four axes. It stands reasonably stable upright, and the carrying handle duals as a support when laid down. This answers a newsletter criticism I read recently about other systems. There's a removable crystal at the back, and the Sanyo 600 mAh nicad pack can be easily unplugged upon removing the rear cover. Sanwa, in quaint Japanese style, have marked the transmitter Ergonomic Conception, and for once I cannot disagree.

The Other Bits

For under $700 (RRP) you get:

- a receiver that is smaller than some other PCM receivers around.
- three SRM 102 servos that are smaller than standard, are quite fast and appear to be tight around neutral. They are not ballraced.
- a four cell nicad pack of 600 mAh Sanyos.
- the usual mains charger, switch harness, pennant and small hardware.

Complaints under this heading? Not many. The instruction manual does not list any specifications, so I cannot give such things as Rx operating current and servo output torque, and my favourite whinge (now on-going for nearly ten years) of a crude fly lead for the charging plug instead of a pukka charge receptacle buit into the switch. Oh yes; the charger's Tx lead is way too short as well.

All Singing - Dancing Radio

Now we get to the interesting part - the 1990's technology that makes these systems desirable and swallows up much of your hard-earned pay. As usual with computer RC systems, it is much easier to learn hands-on than to describe, so I will try to be concise and cover only the major features.

SCREEN. The LCD screen is quite large and the graphics are clear. You can even adjust the contrast. All commands are accessed and adjusted by just five buttons alongside the screen, which beep to confirm input. If you can read and press buttons then you can use this radio. In computer-speak, it is what's known as Menu Driven. In the case of the Sanwa Space, once you learn the purpose of the five buttons, then it's mainly a matter of following the prompts given on the screen. In the main there is no need to refer to the manual, and most modellers will master the operation of this set quickly with minimum pain and maximum pleasure.

Speaking of the Instruction Manual, this is well presented and guides the reader logically through all the features. However, the manual does assume that the operator has some knowledge of aircraft functions. It explains how to set a function, but not **why** you would want to set it. For example, the manual does not explain why some aircraft need ailerons and rudder mixed (to co-ordinate turns on some slow, stable craft), or exponential instead of linear control movement (to make it less sensitive around neutral). But finding out is part of the fun!

DUAL RATE. Switchable servo travel is available on aileron, elevator and rudder. You can dial-in between 0 and 150% for both sides of the rate switch.

EXPONENTIAL. This is available on the same channels and switches as above, and may be varied between zero (i.e. linear) and 100%. Note that Sanwa's is a true exponential; smooth and stepless. Making a control less sensitive around neutral may be beneficial for beginners and pattern flyers alike

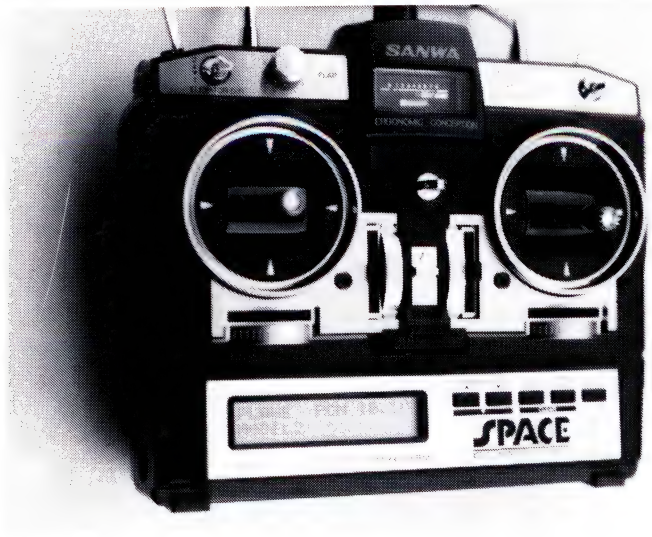
END POINT ADJUSTMENT. The maximum servo travel can be varied between 0 and 150% for both ends of the stick position and for all 6 channels. Like all the adjustments, you simply point to the function for that particular channel, press the plus or minus key and watch the value change. Pushing both plus and minus keys together will instantly get you back to the 100% standard setting.

REVERSE SWITCH. Naturally, all channels may be reversed. Unfortunately, the screen numbers them one to six and you have to refer to the manual to relate the numbers to the channel; e.g. rudder is channel three.

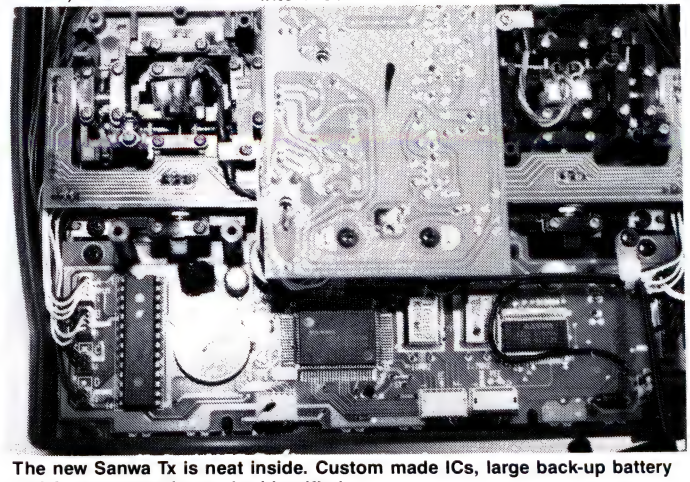
FLAP SETTINGS. Many variables are available for flap settings, and any model configuration should be catered for. The instructions are not particularly clear here, and I spent some time playing with the setttings. Both an infinitely variabe knob and a three position switch are available for flap settings. Basically you can adjust the flaps with the knob, and also throw in programmable flap positions with the switches. One can also re-configure the flap knob to use as an auxiliary control for operation of such things as engine mixture.

MIXING. You can mix elevator into flap (to stop the model from pitching when flaps are deployed), flap into elevator (to move flaps in the opposite direction to elevators - like a control line stunt aircraft) and aileron-rudder mixing (C.A.R. - couples aileron and rudder). Even though set, the mixing can be switched in and out during flight by means of the four switches on top of the transmitter. (See later for details.)

MODEL SELECT. The Space will memorise settings for two models. You don't have to remember which is model one or two, you can input the actual name of your aircraft. If required you can also copy the settings from model one into model two and vice versa. A Data Reset



Appearance of Sanwa Space Tx is not as cluttered as others.



The new Sanwa Tx is neat inside. Custom made ICs, large back-up battery and 2 extra crystals can be identified.

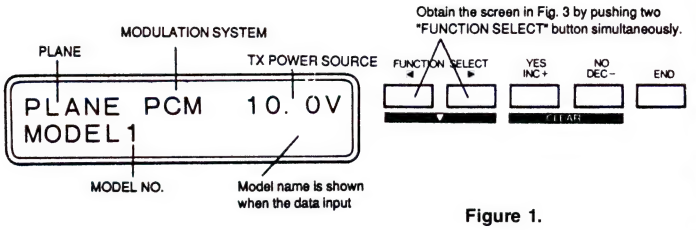
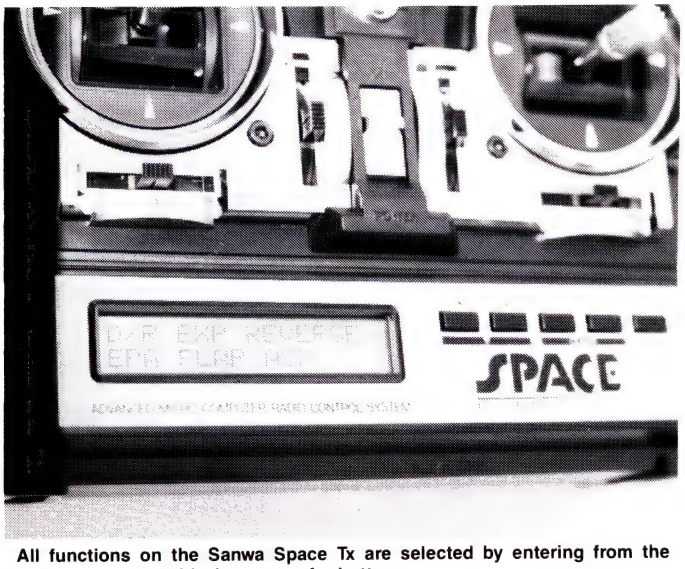
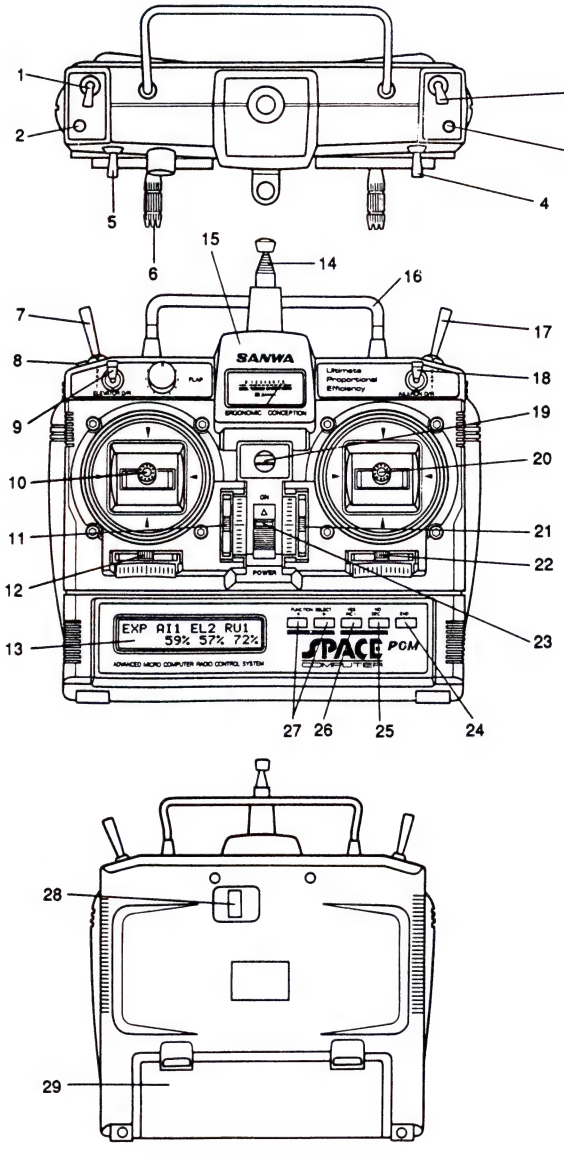


Figure 1.



All functions on the Sanwa Space Tx are selected by entering from the on-screen menu with the press of a button.



1 Switch 4
2 Fail-safe button (MODE I)
3 Switch 1
4 Switch 2
5 Switch 3
6 Flap (AUX) Trimmer
7 Switch 4
8 Fail-safe button
9 Switch 3
10 Rudder-Elevator stick (MODE I), Throttle stick (MODE II)
11 Elevator trim (MODE I), Throttle trim (MODE II)
12 Rudder trim
13 Display
14 Rod Antenna
15 Battery Indicator
16 Carrying bar
17 Switch 1
18 Switch 2
19 Strap holder
20 Aileron/Throttle stick (MODE I), Elevator stick (MODE II)
21 Throttle trim (MODE I), Elevator trim (MODE II)
22 Aileron trim
23 Power switch
24 End key
25 NO Decrement + Key
26 YES Increment + Key
27 Function Select key
28 Crystal
29 Battery cover
30 Fail-safe button (MODE II)

facility enables the owner to quickly reset all functions to the initial condition.

FAIL SAFES. As with all PCM radios, the four primary controls may be set to move to a pre-determined position if a signal is not received at the model. If this occurs, the previous servo positions will hold for about a second before fail-safe operates. The receiver may also be set up with a battery alarm which lowers the throttle control for about 0.5 seconds in every minute if the on-board battery gets low. Similarly, the Tx will start beeping at you if the battery is low.

MODULATION TYPE AND RF SWITCH. You can operate a standard FM receiver with the Space transmitter by switching from PCM to PPM. You can also set up the Tx without it sending out any signal, but you have to switch on (and send out signals) before you can cut the RF (radio frequency).

LOCK KEY. I like this one. All the settings on the Space may be locked to prevent unauthorised or inadvertent tampering. For obvious reasons, I won't say how this is done. You will have to buy one to find out.

SWITCH POSITION. Aileron, elevator and rudder dual rate, flap mixing, CAR mixing and retract gear operation may all be switched by any one of four transmitter toggle switches. That's right, you can set any of the four switches to operate any of the functions mentioned. You can even make one switch do two jobs, or even switch all 6 together! For example, any one switch may be programmed to change the rate of elevator and aileron at the same time. Or you can alter the switch functions to suit the mode you fly, or maybe put the retract operation over on the left of the Tx instead of the right. This last feature is what computer radios are all about: the ability of the owner to take a mass-produced product and individually tailor it to suit his own personal preferences. If that's not enough, then consider you can spend hours playing with the buttons!

Summary.

Sanwa's Space PCM has many desirable features at a very competitive price. By designing their own custom, one-chip micro computer, Sanwa have entered the big league and ensured that the electronics are optimised for RC use. The up-to-date technology shouldn't date quickly. Sanwa have built a reputation for rugged reliability which should take care of the other worry facing would-be purchasers. After testing and reviewing the Space, I have no reason to believe that the tradition won't continue.

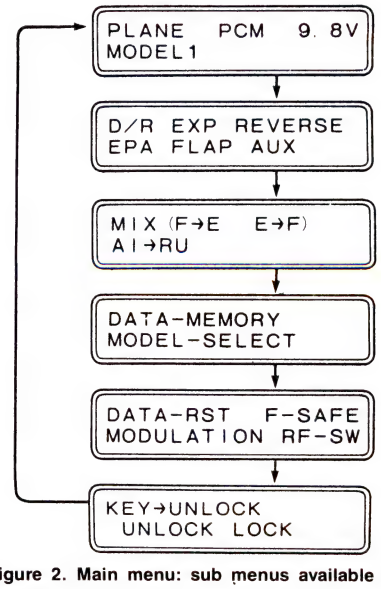
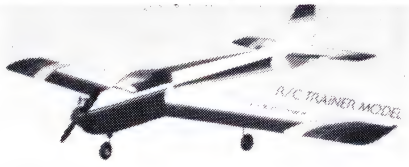


Figure 2. Main menu: sub menus available from these

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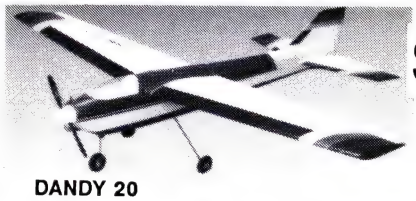
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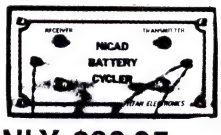
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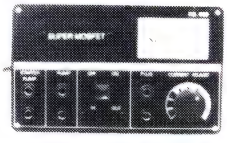
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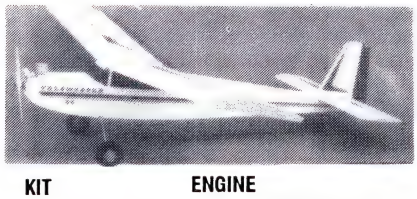
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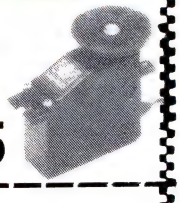
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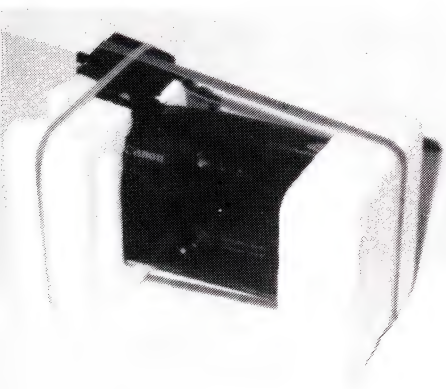
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RADIO CONTROL AERIAL PHOTOGRAPHY

by Andy Gardiner



United MAC model drome photographed from Andy Gardiner's 12 foot span Lanzo Racer by Canon snapshot camera.

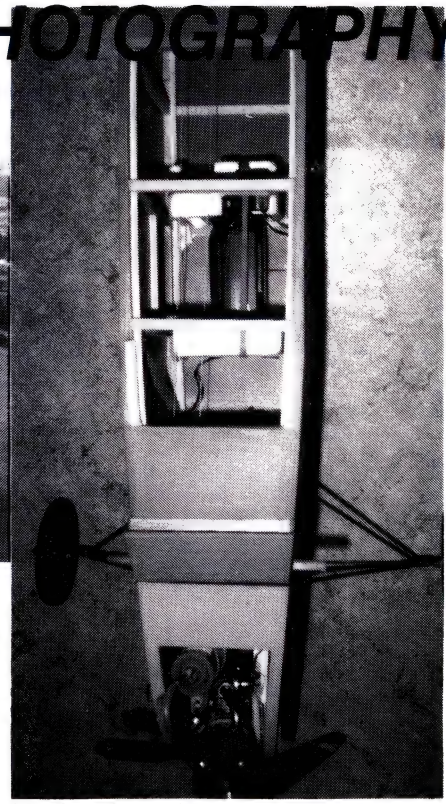


Canon Snappy camera mounted in its styrofoam packing with servo attached, the assembly held together with rubber bands. Camera readily available for other use.

Having previously toyed with the idea of fixing a camera in a RC model, I realised while building the fuselage of my new Old Timer, a 1936 Lanzo Racer, that there was more than enough room in the fuselage for a 35 mm camera.

Although I already had a camera, I wanted a lighter one with a motor drive. Eventually I settled on a Canon Snappy EZ, which has fixed focus, film speed selector and, most importantly, motor drive. It cost $89. Setting it up in the model was simple, as the camera came in polystyrene packing. The two pieces, with the help of a couple of rubber bands and four small pieces of Velcro, hold the camera securely in the fuselage. A small servo was attached to the polystyrene with Velcro, and a spare function of my JR Apollo Tx (landing gear) was used to activate the shutter and film advance.

I first experimented by taking some photos with the camera facing down through the bottom of the fuselage but, although the photographs of our flying field were interesting, they lacked perspective. I then cut out the Solartex on the side of the fuselage and faced the camera horizontally, and the results were much better.



Location of snapshot camera in the big Lanzo. Position is on balance point of complete aircraft.

(For me they were on a par with Voyager's photographs of Neptune and Venus!) I am still experimenting with different films and film speeds.

The camera and servo in the RCAPOT model weigh about 8 oz and, of course, are fixed at the CG. I have noticed no difference in the flying characteristics with the camera on board and the panel removed from the side of the fuselage. I have actually managed longer flight times (engine off) carrying the camera.

My Lanzo Racer is 12 foot span, weighs 8 lb and is powered by a Saito 65 4-stroke. The engine mount is fitted to the firewall with home made rubber mounts to dampen vibration. I am sure that most models of 6 foot span or more could be used for aerial photography.

(See also AEROMODELLING DIGEST 1990, p. 87, for more information on aerial photography.)
[Advertisement elsewhere in this issue.]





Framed side aperture for camera view port. Eight ounce payload not noticed by model nor the Saito 65 power plant!

The author with his Lanzo Racer adapted as a camera aircraft. No beauty queen, but an excellent camcraft for photography. See a more detailed article about aerial photography, stills and video, in the Aeromodelling Digest 1990.



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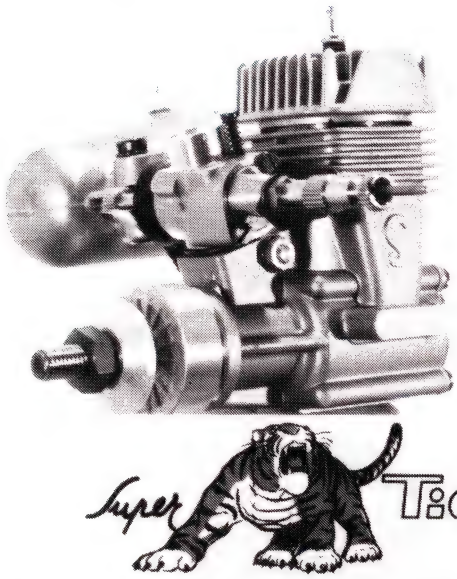
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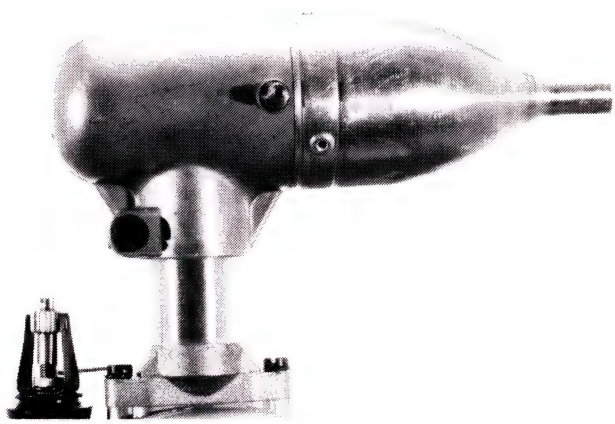
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Engine Review

Super Tigre S 29 K





Super Tigre muffler has adjustable position like a trombone. Change in exhaust note noticeable from close in and far out!

Super Tigre's latest 5 cc model. Hefty, compact and purrs like a tiger. Clean lines and finish add to the appeal of top performance.

RED WINE????

My first experience with Super Tigre was in the mid 50s. My local club was going through a phase of team racing; every weekend we had a series of team race competitions; and the pace became so fast and furious that the adrenalin flowed like tomato sauce at a pie-eating spectacular. The range of engines was reasonably limited, as we did not see too many desirable brand names that matched the bump in the hip pocket. The few eye-opening engines were mostly bought for the modeller by a kindly uncle who had been overseas.

So it was with the first Tigre. The member turned up for the weekly team race bash with a new engine fitted to his model, and commanded attention from all present. "My uncle got it for me in Italy - red hot racing engine. It's a Super Tigre. They win all the contests on the continent" was his boast. Well, I don't know if anybody had then heard about these engines, as they were a new addition to the field in Italy, and we certainly weren't flooded with them in Oz. A few remarks such as "Whaddya run it on - red wine?", "Do ya havter use spaghetti for fuel tubing?" and "D'ya havter use olive oil init?" did nothing to take the shine off the member's new acquisition.

He filled the tank, lined up for the first event and promptly flogged the ar.. err tail off everyone. He did so for the rest of the day! I don't know about the rest of the members, but I was impressed. The name Super Tigre was firmly embedded in the 'want - must have' section of my brain.

I didn't get my own first Tigre till the 60s, but it was worth waiting for. I still have it, and it is still running, as are a few more gathered along the way. Many Tigre owners will tell you that the engines are indestructible, as they never seem to wear out. I tend to agree, as I have had a few well-used models on my bench for de-glugging and evaluation ("been stored for a while; forgot about it; never did get around to cleaning it" owners' explanation) and, except for one, I was able to restore all of them to good song after nothing more than a good clean. The one I missed on is just a point of interest, regardless of the type of engine. The owner had lost radio contact, and the model power-dived from 400 or 500 feet onto a model railway track that was a mere 12 mm wide. If you stood over the top of the rail you couldn't drop the engine more accurately. Yes, a total write-off. The owner was so astonished at the speed the engine pulled the model down in the dive, that he went out the following week and replaced it with another Tigre, with the philosophy that they had to be good engines if you had to dive them onto a railway track to destroy them.

SPECIFICATIONS

Bore:	**19 mm**
Stroke:	**17 mm**
Displacement:	**4.82 cc**
Quoted power:	**0.75 BHP @ 17,000 rpm**
Weight:	**240 g**
Propeller range:	**9 x 7 to 11 x 4**
Lubrication:	**50/50 castor-synthetic**

Super Tigre engines have always been of high quality and good appearance, and the name appears consistently in the winner's circle in competitions around the world. More recently the addition of the 20, 25 and 30 cc units put the company name on the lips of a lot more modellers, as there has been nothing to equal the starting and running qualities of these big beasts. It would be a rare large model meet that didn't have at least one large Tigre quietly powering some modeller's creation.

The entire range of engines has had some cosmetic changes, and some have benefitted from internal modifications that are the exclusive domain of the company. The engine on test has had one such modification by way of a non-pinch piston in an ABC set-up that had me wondering at first but .... well, I'll tell you more when we get on a bit.

This is the first Super Tigre engine that I have tested, and one of very few test reports that I know of, which is a pity, as the range of engines caters for a very broad appeal in types and sizes, and I am sure that modellers would like to hear more of these fine machines. Without further ado, let's rip it apart.

Castings

These include the maincase, backplate, head, exhaust header pipe, front half of muffler, propeller drive disc, piston and carburettor body.

The design of the **maincase** gives the engine a nice, squat appearance that, to me, gives it a bit of character. There are some nice touches, such as the rounded sections to receive the bolts for the backplate extending the full length of the crankcase, the bypass molding section very prominent from the top of the mounting lug, the square rib along the bottom of the crankcase and the extra-thick mounting lugs. For a miniscule weight increase, much strength is gained. The casting is of a high grade with a fine texture finish on the outside and top class machining on the inside. Other points, such as the blending of the bypass port with the crankcase undercut section and the wedge section of the exhaust manifold, tell the story of careful design and attention to detail. The carburettor manifold is offset to the left of the crankshaft (looking from the front) and this increases the intake timing opening to maximum without putting a large opening on the top of the case and creating a weakened area. The extra open area in the shaft housing is re-inforced by extending the side of the intake manifold down to the centreline gusset. A very cunning bit of design work, and I consider that you might need to dive this engine onto a railway line also if you wish to destroy it. Other nice little points are the crescent bar for securing the carburettor, sealed front of the front bearing, groove from the bottom of the intake manifold to feed oil to the front bearing and the square external section of the intake manifold that really strengthens the area generally most damaged in a deep landing.

The **backplate,** or rear case to give it the correct title, is like most others, but it does have a super gasket. It is a thick, white, tough material

FOURMOST PRODUCTS

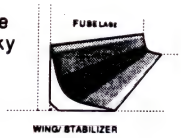
Fourmost Fillet



The Fourmost Fillet is a continuous strip of vinyl preformed to make a perfect fillet.

The Fourmost Fillet gives a clean perfect contour without the inconvenience of gummy fillers and sticky putties.

Three sizes available:
Small No. 128,
Medium No. 129, and
Large No. 130



The Fillet may be easily installed with cyanoacrylate adhesives and can be finished with either paint or iron-on materials. The Fourmost Fillet is also perfect for wing saddle seats.

WINDOW FLANGE



Three sizes available:
No. 132 - Small - .150 inch
No. 133 - Medium - .250 "
No. 134 - Large - .350 "



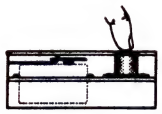
The Fourmost Window Flange is a flexible black vinyl strip preformed to make a perfect flange.

As well as securing the window in place, the fourmost Window Flange provides a realistic black outline without the inconvenience of tape.

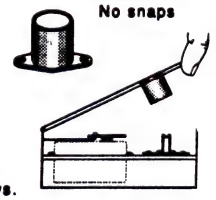
The Fourmost window Flange is easy to install in rectangular as well as contoured windows with just a razor blade and CA adhesive.

Flush Button

Hatch Release Mechanism



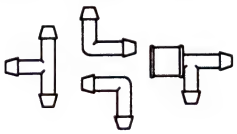
No rubber bands
No screws
No snaps



Open and close any hatch with just a finger tip.
Button may be painted to match any finish.
Easily installed with cyano-acrylate and provided screws.
Weight: 2 grams

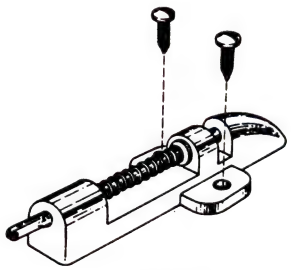
No. 131

FUEL FITTING SETS



SMALL FUEL FITTING SET
SIZE: 1/16" I.D.
1 Tee, 2 Elbows, 1 Pen Bladder Tee
PRODUCT NO. 104

BOMB RELEASE



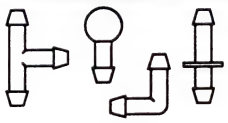
PRODUCT NO. 119

COCKPIT COAMING



SIZES:
No. 114 - 2 Ft. - 3/32 & 3/16 Inch O.D.

No. 120 - 3 Ft. - 1/4 Inch O.D.
No. 127 - 3 Ft. - 3/8 Inch O.D.



LARGE FUEL FITTING SET
SIZE: 3/32" I.D.
1 Tee, 1 Elbow, 1 Union, 1 Plug
PRODUCT NO. 109

Large Fuel Fittings
Available Individually:

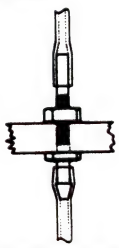
4 - Elbows	No. 110
4 - Tees	No. 111
4 - Unions	No. 112
4 - Plugs	No. 113

Bulkhead Fittings

The Bulkhead Fittings are a simple method to feed fuel and vent lines through solid bulkheads.



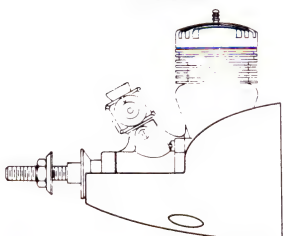
Color coded
Eliminates kinks
Weight: 1/2 gram each.



No. 121

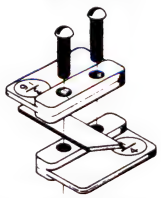
Size: 3/32 in. I.D.

.40 AIRFLO ENGINE MOUNT



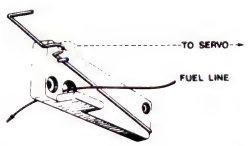
PRODUCT NO. 116

GAPLESS HINGE SLOTTER



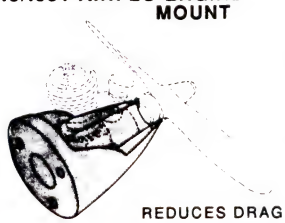
Makes Slots in 4 Sizes of Balsa
3/32 - 1/8 - 3/16 & 1/4"
PRODUCT NO. 115

FUEL SHUT OFF



Can be Used to Control Fuel Flow in Starting.
Positive Airborn Shutoff.
PRODUCT NO. 103

.049/.051 AIRFLO ENGINE MOUNT



REDUCES DRAG
VIBRATION FREE
PRODUCT NO. 107

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that came off in one piece without sticking. The thin gaskets fitted to most engines seem to me to be designed to fall into several parts as soon as they are exposed to the light, and always at night or weekends when there is no chance of obtaining a replacement, even if the local model shop has any in stock. This gasket will hold up to the strain many times.

The **head** is a deep finned, square unit (matches the square section of the barrel fins) that fits over the top of the liner. Sealing is assured by a copper gasket set in a recess surrounding the squish area. I believe that a few of these gaskets came out from the factory in a hard state instead of being annealed. If you have any trouble tuning the engine, it might be due to the hard gasket not giving a perfect head seal. The problem is simply remedied by removing the gasket carefully with a fine point needle, heating it until yu see a colour change, then dropping it into cold water. I don't think that many gaskets had this problem, and it certainly did not apply to the test engine, as the head seal was perfect. A good point, not often seen on some of the smaller capacity engines, is the brass insert in the head for the plug thread.

The **exhaust header** bolts onto the engine and is in the shape of a flange, the attachment area blending into the tube extending 47 mm from the manifold face. The **muffler** slides onto this and can be set in an infinite number of positions to suit your needs. The muffler is made up of a cast front section and a formed aluminium sheet rear cone ending up into a 7 mm outlet stinger or tailpipe. The sound can best be described as a brrrriiippp rather than a brrraaaarrp. (Where else do you get sound effects?)

Piston and Liner

The liner is a very solid unit of brass with a chrome-plated bore. The porting is the company's own design and proudly named Super Tigre scavenged. I'll say this: engine fiddlers won't find any spare area for enlarging or adding porting, as there isn't enough metal left; it's all been taken up with ports! The usual taper found in ABC engines is not as pronounced here, as Super Tigre have come up with a new machining process on the piston to eliminate the 'Top end pinch'. The finish on the chrome bore appears to be a ground surface without the usual cross-hatching marks of the lap or hone. These are found on the piston! I can't recall seeing this finish on a piston before; a deep, intensive cross-hatching pattern indicating a finish done with a hone or lap. Maybe this is the new process, as there were no other visible differences. Perhaps this finish on the piston retains a lot of oil which would provide a good piston liner seal. Another odd point was that the piston would travel further up the bore the correct way up that it would upside down. Before you jump to a conclusion, the extension eyeball revealed that the wear area on the piston from running was all around the crown, with no sign whatsoever of wearing on the skirt. Does the entire piston reach maximum expansion after running for a while, or does the crown enlarge more due to the skirt being cooled when coming down to the crankcase area? There's a lot more to successful engine design than meets the eye, isn't there? Whatever the process or reason, it certainly works, as evidenced by the running results.

The conrod appears to be a casting, yet all surfaces have been machined, which tends to negate the benefits of casting. Then again, Super Tigre do have a reputation for particularly strong rods, so they have their reasons. The big end of the rod is bronze bushed and drilled for oil entry.

Crankshaft

This is a bit of top class work, with one of the best quality threads I have seen outside a toolroom. It is of gauge quality and the (almost) standard ¼ x 28 UNF. The ground finishes are extremely fine, and the work around the counterweight is well done and quite interesting. From the front view a full disc is evident, with an oil entry slot in line with the crankpin. From the rear view the weight has been machined to the normal shape and the entire outer diameter has been ground. The prop driver is, for a small engine, a massive 26 mm diameter, which gives a very good grip on whatever prop you might want to use.

Carburettor

This is the new Mag twin needle type, and a very impressive unit. The ground steel barrel is sealed into the body with a rubber boot, and the revolving action is as smooth as talcum powder on a baby's bald head. The externally threaded insert needle is gone, being replaced by a needle and barrel of sturdy proportions. The needle is finely tapered, and the thread is fine, which gives a broad tuning range even when synthetic oil is used. A restrictor insert is fitted as standard, and can be removed for the high rev fanatics, but I elected to test the engine as it was, and found that the carby worked smoothly, transition was rapid with no lag, and position response was almost instantaneous. (Position response = going up or down to a required rpm, such as idle from top speed.) The rather large proportion of the carby to the engine gave plenty of room away from the engine itself and the prop for tuning purposes.

The Moment of Truth

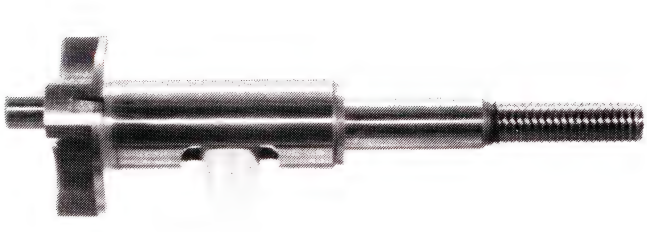
The engine came fitted with a plug which, it would be reasonable to assume, was a Super Tigre candelle, or glow plug to you non Italian speaking readers. It appeared to be the standard No. 2 model. Magnum sport fuel was used, and a Taipan 9 x 5 prop fitted. The company sets down in the instructions that bench running is needed only to familiarise yourself with the engine and the starting procedure. The engine started right off and, by the way it ran, I considered that only a very short run-in was needed for settling in before prop testing. Right from the start the engine was eager to perform, and the rpm built up by the minute. After 15 minutes I could hold a lean tune without the engine showing any signs of distress whatsoever, so I got down to some serious testing straight away. The engine is amazingly easy to start in two respects. It fires off every time, hot or cold, in not more than two flicks, and the 'flicks' are really pushovers. A half-hearted push at the prop and away it went. As I consider that a high percentage of readers are more interested in general sport flying and good pulling power, I tested the engine in the rpm range most suited to that aspect of use. The engine has a potential of 17,000 rpm, and you can chase this output by removing the restrictor in the carburettor, fitting the Tigre's Paw muffler, which is a company designed tuned pipe unit, and using pylon type props. The engine will take this higher output quite easily construction-wise, so don't be afraid to try it if you have a need for this performance. The figures I recorded were very impressive, particularly when you read of the props I used and, as I was also considering this aspect, the prop noise was quite low. Most impressive was the Bolly 4-blade, as the prop noise was way down. The engine ran very cool throughout the tests, and no vibration was apparent at the usable idle or high rpm.

Taipan	9 x 5	12,500
Taipan	9 x 6	11,250
Broad blade wood (home made prop)	8.5.x 8	9,500
Bolly	10.5 x 8	9,000
Bolly 4-blade	9.5 x 6.5	9,500; idle 2,000
Zinger	8 x 7.5	11,250
	All-round idel	2,600

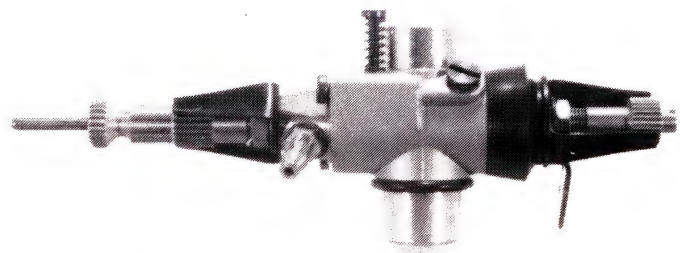
Summing Up

This is a very fine little engine from a long tradition of high performance and quality model engines. It has ample power, and would make an ideal engine for newcomers to the field and for old hands who want a low-priced, easy-starting star performer. Buy one, get another for the same price; or two for just twice the price of one.

Engine for test was supplied by Les Myzen of Bryzen Hobbies, 47 Macquarie Road, Fennel Bay, NSW, 2283. You can get yours from Les or any hobby shop with stocks of quality merchandise.



Super Tigre crankshaft has high quality finish. Ground surfaces and threads are faultless. Crank disc is complete, but web is ground away to improve balance.



Super Tigre throttle has adjustment knobs well away from centreline. Main needle, left, idle mixture needle at right has screw driver slot. Rubber boot covering open end is a good idea.

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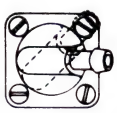
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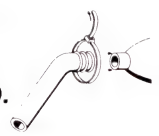
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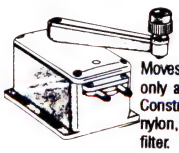
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- Lifelike vinyl latex rubber parts.
- Easy to assemble and finish.
- Can be assembled as either a Sportsman or Barnstormer pilot.
- Kit contains pilot head, helmet, sport cap, goggles and jacket.



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DGA-104	1/4 Scale	4-3/8"	1-1/2 oz.	$17.90
DGA-103	1/3 Scale	5-3/4"	2-1/4 oz.	$28.90
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Barnstormer Shown

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- Kit contains pilot head, hands, boots, helmet, cap, goggles, full templates, and easy instructions.
- Fully positionable and movable.
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DGA-205	1/5 Scale	14-1/4"	3 oz.	$18.95
DGA-204	1/4 Scale	17-3/4"	4 oz.	$19.95
DGA-203	1/3 Scale	23-1/8"	6 oz.	$32.95

* Weight may vary depending on material used in construction

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Dick Graham was an early user of Koverall and used it on his 1980 National Champion Piper Pawnee. Dick says: "Koverall produced excellent results on my 1/4-scale Pawnee. It is easy to apply, shrinks as required for uniform tightness, and the close weave takes dope without leaking through onto the inside."

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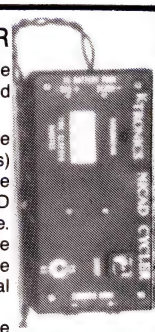
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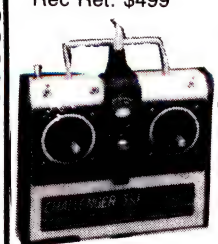
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POWER HUNGRY?

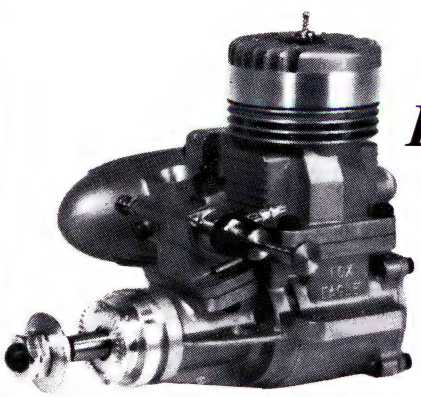
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AND NOW FOR SEVERAL THINGS COMPLETELY DIFFERENT

For this month the operative word is NEW. I have some new items that might have escaped your notice and some items known only to me and the agents at this time. The other new is for new members to the flying field. I often get on the soapbox about extending the hand to new members, but it took Vernon Berger from the ACT to remind me that it is about time to practise what I preach. Vernon has been writing to me for quite a few years now and I still have some good information from him to present to you when the space is available. His latest offering is a primer for new members to the club to which he belongs and it is a great piece of work. He suggested that I might consider a section for beginners every 12 months or so, on setting up engines, tanks, fuel and so on, to set them on the right path. He opined that some established modellers could also benefit from the article as a bit of a refresher. I agree with all you say, Vernon, but add this. Some of our brothers would still get it incorrect even if I drove it into their skulls with a jack-hammer. I am still amazed at the well established modellers who turn up at my workshop door with engine problems that are simply a result of a glow plug not performing correctly or a tank incorrectly set up.

To give you a 'frinstance'. A newcomer came to me to ask my advice as to what engine he should purchase. He had a ready-to-fly model under his arm fitted with a new, popular brand engine. A modeller at the field had told him that the engine was no good and that he should buy something else. The engine would fire at odd times but would not run. I have a reasonable 'feel' when it comes to checking engines as far as whether the engine has the potential to go, as far as pistton fit and compression are concerned. This engine felt okay to me. To save time working backwards, I first checked the fuel tank in the model. It had no pick-up tube for the fuel! The movement of trying to start the engine would splash a drop or two of fuel into the metal tube in the neck of the tank, and this was enough to get the occasional kick. I was later told that over an hour was spent trying to start the engine.

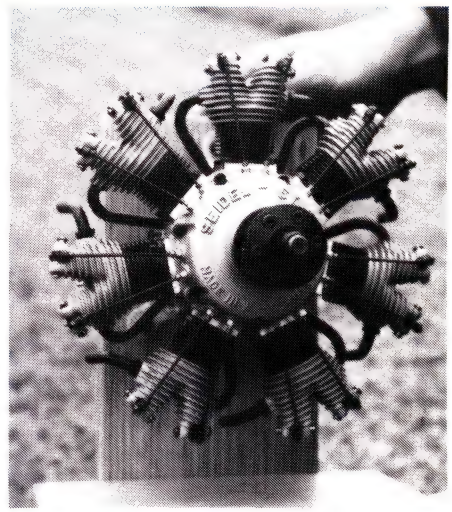
Another 'frinstance'. T'other day I dropped in to speak words with a flying mate and he had his latest creation on the bench - bewdyfull - but the engine was running like a 'busted ask yer muther fer sixpence' (his description). I got him to fire it up and, as soon as it started I was able to tell him that the plug was either no good or too cold. He changed the plug and the engine sang a sweet song.

I'm not claiming great knowledge of engines, but I do claim the power of reasoning and deduction. If an engine is mechanically sound as far as compression and joint seals (head - all engines .. crankcase - 2-strokes) and there are no broken parts, it will run. If you cannot make it do so, consider the reason(s) why not. First off, fuel. Is it correct, no water, getting into the engine? Next is ignition. Battery adequate, plug (glow or spark) working, compression correct (diesel)?. These are the questions you must ask yourself when you have an engine problem, either yours or the one in the beginner's model that you are going to test fly. A beginner is going to have trepidations about you flying his first pride and joy if you exhibit your 'expertise' by not being able to start his engine for him. There's got to be a reason, and you can generally find that reason if you consider the points of observation.

At a field recently I was talking to a newcomer about his model. In my estimation it was over-powered (most are) for a trainer, so I advised him to fit the prop in reverse. A couple of the senior members were prepared to have me committed to a funny farm, but I had a reason. I know, I'm well aware that engines have a throttle and can be throttled back, but ABC engines are not happy tootling around at one third throttle for long periods, as it causes the liner to varnish up. Anyway, we will have a look at some basic points later, as I have these goodies to show you.

SOME GOOD STUFF

In a recent issue I told you about **Cool Power** synthetic oil. Now I can tell you what the fuel is all about. Eddie Edwards is bringing the Cool Power range into the country, and you can see the range in the advertisement in this magazine. It is a bit hard testing fuel; it either works or it doesn't. What we have to look for is the temperature of the engine, performance and internal residue. The brew I tested was 15% nitro, castor/synthetic oil and methanol. The fuel performed quite well, with the engine reaching maximum performance and steady idle. Exhaust goo was minimal and clear, and the head temperature of the engine was well within the safe range. The test engine was left (without flushing) for about 6 weeks and then tested again. While cold it was quite free, and a check inside revealed just a mild discolouration on the steel parts from the nitro. The absence of rust indicates that the after-run properties claimed for the fuel are not an exaggeration. This test was done on a 2-stroke engine where the problem is not as great as it is with a 4-stroke. I am not prepared to take the risk with one of my four-strokes as far as corrosion testing, but I consider that I might be over-cautious, as this fuel appears to live up to the claims of the manufacturer. A good drop Eddie!



This huge motor is the Seidel ST 770, available from Germany for 3600 DM. Capacity is 70 cc, weight is 2.63 kg and power output is rated at 4 BHP (2.98 kW). Recommended prop is a 24 x 10. Proud owner is Anthony Mott. Photo was taken by Norm Bell.

The next item falls into the 'why hasn't somebody thought of it before' category. From **Tettra** accessories, Japan, we have the **Fuel Tank Pipe Bender.** This little gadget is worth its weight in yak butter. Rather than describe it, look at the photo and I will tell you how to use it. The roller right on the end is like a pulley, as is the little one down on the corner. The metal tubes are fitted to your fuel tank straight, then bent to shape with this tool without kinking or flattening out. Magnolious! (def [5] good, bewt, grouse.) The other wheel further up the handle is for smaller diameter tubing. On the other end is a fork that can be used for pulling silicon tubing off aluminium tubing (it does stick!). All in all, a really handy gadget that does a job perfectly, simply, quickly and economically.

From the same company we have the yick nikky yokky oh, which is as close as I can get, as the printed matter is all in Japanese. I consider this item to be in the 'better mousetrap' category. (You know; build a better mousetrap and the world will beat a path to your door. This has always alarmed me when I consider the world coming up my front drive. For that reason I don't build mousetraps.) Anyway, this yikky nikky is a **Centre-Finder,** the sort of gadget you use for indicating the centre of trailing edges of fixed surfaces and leading edges of moving surfaces for hinge positioning. What puts this one ahead of others is the twin pantograph set-up that allows the locating plates to open parallel to a gap of 37 mm for the centre line location on surfaces up to that wide, or one end can be kept almost closed and the other opened right out, which is ideal for marking the fin position accurately on the fuselage. Once you have one you will find a multitude of centre-finding uses for it, and it will stay with you for a long time on account of it being well made,

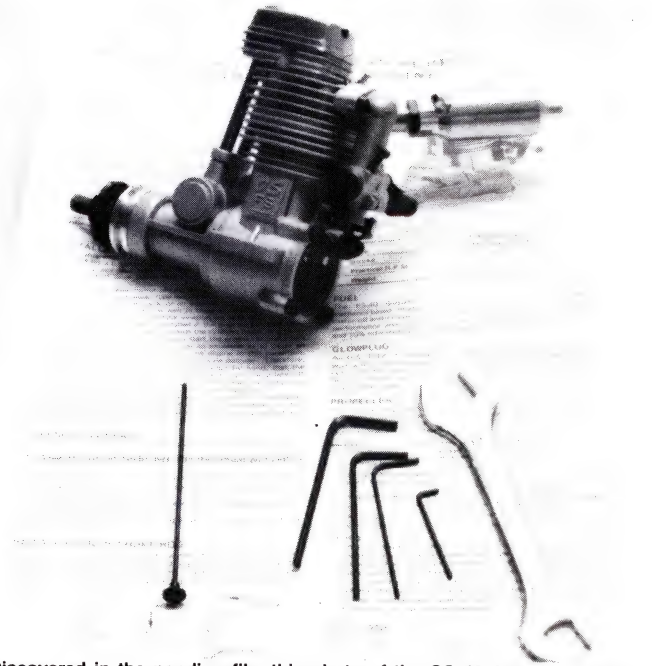


Fuel tubing bender with a length of tubing bent in a manner you may not need. No kinks or flats!





The Yikky-O (Engin-ear's translation) centre finder in closed and fully open positions. What is the little nib on the RH end for?



Discovered in the pending file, this photo of the OS 40 4-stroke Surpass, shows the slightly top-heavy appearance of the engine; and the choke lever, Allen keys and spanner which are included. Underneath them is the instruction sheet, nicely printed in good English, and very informative. This model and several other OS engines have recently been re-stocked by Model Engines. Check with Tony Farnan for prices and availability.

sturdy and plated for corrosion protection. It has a little extra bit on one end, and the illustration sets out some use for it but my Japanese reading is a bit rusty so I can't tell you what it is for. Any of you bright sparks who can read the lingo might consider letting me in on the secret, as I am intrigued as to its use. If you wish to purchase one, ask for the hinge line centre finder from Tettra no., 1412. You can have both or either of these gadgets by speaking nicely to the Kellett gang at Liverpool.

How Hot????

What is the correct running temperature for a model engine? How hot is too hot? If the piston melts, does it mean that the engine is overheating? The manufacturer states that my engine will do 72.5 krpm; you say that I should not tune it to this on the ground; why not? I want every last rev from that beast, so I lean it out until the plug glows externally. Yes, all good fun, but many a true word is spoken in jest. Our model engines (using methanol fuel) run at an optimum temperature of 190°C, with an acceptable range between 177 and 195°C. A lower temperature than this will rob you of engine performance and cause premature wear as the moving components are not reaching the working temperature and, as such, the fits remain too tight. You should, by now (I've been blasting you about it for long enough!) know that higher temperatures can really kill an engine quickly. One short, lean run can kill an engine in one blow, and this is the biggest cause of short engine life. Following closely in second place is the enclosed cowl situation. If you cowl an engine you must have adequate frontal area air intake and four times as much outlet otherwise you stand a good chance of cooking your engine. (Look for silver splashes down the side of the model; it could be melted piston.)

"Okay" you say, "how do I go about checking the running temperature of the beast?" "Simple," sez I. "Stick on a Tindex!" (No. It's not a foot complaint, or cure for same.) Tindex is short for Thermindex, which is a temperature indicating device. Actually, it is a column of coloured dots with degree readings alongside. The strip is 50 mm long by 18 mm wide, but it could be cut down to 35 x 5 mm with dots only and keeping the degree marked section as a comparison check. The strips are contact adhesive coated and the colour change is irreversible. Getting down to the nitty gritty, you stick a strip on the head of your engine and run it (in aircrat, boat or car). When the model is back in the pits or dock, you check the strip and find what dots changed colour. (Remember, the change is irreversible. Once the colour changes, it stays that way.) While not as sophisticated as the real thing in full size aircraft, cylinder head temperature is the most accurate method of checking the fuel mixture, so I can see many applications here for all modellers, with particular emphasis on tuned pipes, cowled engines, large props, helicopters, high performance boats and cars. That's just about all facets of the hobby, isn't it? Well, I said they would be very useful, didn't I? About $1.80 per test (they come in packs of 10) is the cheapest insurance I know of for protecting an engine, particularly when you compare $1.80 to the cost of, at least, a new piston and liner. By the time you read this the strips will be available at Kellett's Hobbies, and the grade you need is series 8-grade D, which covers temperatures from 166 to 400°C. If you reach the 400 mark you are on a downhill path towards Stuffed Engine Junction, and this is one way traffic.

Late Final Extra: Garry Kellett just rang to say that he will sell them at $17.50 per pack of 10, or he will cut one strip for a once-only test for you at a cost of $2.00. Where can you get better than that special for Airborne readers?

NOW HOW DO THEY DO THAT?

Earlier this year I spent a pleasant day with Ivor F checking out the methods used for making model engines. I was particularly interested from the point of view that the methods were mostly those that could be employed by home builders to make parts or entire engines. It is surprising how simple it can be. This story, and many others on all aspects of the hobby, can be yours when you purchase your copy of **Aeromodelling Digest 1990.** A magnificent publicatiion with articles by many familiar names in the hobby, covering some usual and very unusual aspects, including understanding weather patterns and signs, aerial photography, aerodynamics in layman's terms, vintage models, 10 plan and construction articles and a list of 130 John Pond rubber power models now available in Australia. I really enjoyed reading every page of mine and I especially enjoyed the 'Ivor F Story', which is well written and illustrated and ... and ... my hat is squeezing my head every time I blow my trumpet! Get yours **now** from Samaria Concepts, RMB 1798, Benalla, Vic., 3673 for $15.00 post free (wotta bargain!). Send cheque or money order. Readers outside Oz can check the rates in the advertisement elsewhere in this magazine. Buy two and double your pleasure!

ONCE MORE, FROM THE BEGINNING

I have more good stuff such as super wheel axles, electric motors and drills, but you will have to wait as I don't have much space left for the beginners' section. Some basic stuff now; more next issue. Right then, first engine. Well, I would say nothing less than a 6.5 cc two-stroke engine, which you will know as a .40. I recommend a ringed engine of moderate performance, running an 11 x 5 (modern day) plastic prop.

Why? First off, you established modellers (who **will** be assisting the newcomer) must agree that a larger engine is much easier to fly considering

reasonable weight and speed factors, so a lightly loaded .40 model would be the minimum to start on. If the design is correct for the purpose it will be forgiving on bad manoeuvres, have good inherent stability, a good glide, ability to tolerate moderate wind conditions and easy to see when 10,000 feet up (international agreement that altitude be expressed in feet). I like a ringed engine for the purpose, mainly because they tolerate variable running speeds better than an ABC, such as long periods of low throttle application, and are less susceptible to dying an early death from a lean run. When the engine starts to slow down or won't hold an even tune, a new ring will inject a few more hours life, and this is less costly than a new piston and liner for an ABC engine. (Remember, a lot of beginners are struggling a bit to get the extra cash for the hobby.) It is obvious that moderate performance is desired, as the high performance engine will be less tractable, harder to tune and cost a lot more. I say an 11 x 5 prop as this will give good performance all round without scorching the sky, and has a better pulling potential for getting the model out of a tight spot when the ground is starting to jump up rapidly; the bigger diameter can claw a larger area, and this is what is needed to pull the model out of tight corners.

Fuel should be 4:1 - methanol or Shell A (4 parts) to one part castor oil or Castrol M. Forget the nitro and other exotic brews. We are in the business of learning to operate an engine and fly a model. Follow the KIVS principle (nice variation: Keep It Very Simple). I also recommend a ready-mixed fuel from an established company, as I have seen some odd variations of the 4:1 mix, as well as fuel ruined by moisture. Magnum 4:1 is a good choice, as it is the fuel used for competition purposes for a long time.

Buy two propellers just in case. Some early landings (early in your training, that is) tend to be a bit hard or slightly below the surface of the field, and this tends to break props. Continuation of training is the absolute best method to gain experience rapidly. If you break your only prop on the first flight of the day it might be a week before you get a chance to fly again. By that time 95% of what you learnt last Sunday is lost. You really need 4 or 5 good flights close together on the one day to have the learning process sink in. Better still, buy three props; they will always be useful.

Glow plus. Yes, could be a problem first off if you don't understand them. Basically, the plug has an element made from an alloy of platinum that glows to provide ignition for the engine. Your ignition timing is controlled by the heat range of the plug and the depth it protrudes into the head. A 1.2 to 1.5 volt or, if indicated on the plug packet, 2 volt power source, is required to heat the plug initially. The element of the plug is basically a rapid short circuit of the battery and, for that reason, dry cell batteries are not suitable for this purpose. Again, keeping initial costs down, you might consider making up your own glow driver unit with a heavy duty D cell nicad battery and a pair of alligator clips. Polarity is not considered in this instance. Keep the leads close to 450 mm long for safety (clearing the prop) and minimum voltage drop. You can sort out a charger yourself as there are any number available, at low prices from hobby electronic stores (e.g. Dick Smith and Tandy) and places like Super K-Mart. You may even have something already on hand, so check out what is available to you (someone in the club will be able to advise you) before spending out on a single purpose, expensive unit. You can even charge up from your car battery if you wish, and again, there is certain to be someone in the club to assist you with this project.

Okay, we wind out the main needle about 3½ turns, choke the engine twice, connect the battery to the plug and start the engine. Once the engine is running the battery is disconnected, as the combustion heat, pressure and catalytic action of the fuel (only methanol is suitable for this) will keep the plug glowing. If the engine dies on idle when you disconnect the battery, it probably indicates a plug too cold for the engine. Try a hotter plug or a plug with an idle bar. If the engine has a crackly noise or a metallic clanking when running at high speed, the plug is probably too hot, so ... use a cooler plug. I am simplifying the plug diagnosis as much as possible, as this is a beginning, and we can go into plug problems more deeply later. I would suggest that, if the engine is not supplied with a plug you should try a Taipan green idle bar plug, as I have yet to find a sport engine that will not run on one of these. Buy two, or, if the engine has a plug fitted, one, as a spare plug is as handy as a spare prop, and you never know when you might blow a plug, which will probably signal the end of flying for the day.

Once the engine is running it has to be tuned for high speed and idle. From **behind** the propeller, with the plane secured to the ground, open the throttle fully and **slowly** wind the needle in until the engine peaks out and will not gain any more rpm. Now, wind it **out** a ¼ turn to richen the mixture. We do this due to the fact that the engine will lean out once it is flying and, if it is fully lean on the ground, it will run over-lean and cook in the air. Do not let anybody tell you that this is not needed; they don't have to worry, if the engine seizes up or breaks a conrod. It is you who will have to dip deep to pay for repairs. By all means elicit help from experienced members of the club, but learn to tune the engine yourself and always tune it slightly rich as I dvise; it will pay off.

You can now set the idle speed, and this is the screw generally on top of the carby. You might have to tune the idle mixture, and this is the screw in the end of the carby where the throttle arm is fixed, or across the front of the carby and entering into a small hole in the front of the carby body. If you have the latter type of carby, it is an air bleed unit and needs to be fully opened for choking. Idle mixture adjustment is done in tiny fractions of a turn; 1/8 at the most; and wait for a few seconds for the adjustment to take effect. If the engine revs up slightly and stops, it is too lean. A rich mixture is indicated by the rpm slowing down and the engine stopping. Once you have all needles and adjustments set, hold the model firmly above your head (for safety), with the nose pointing straight up. This attitude is placing the maximum demand on the engine and, if it is tuned too lean, it will slow down and stop whilst in this position. Richen mixture! The engine must continue running without change in this attitude, otherwise it might stop at an embarrassing moment when flying.

Okay then, that's a start for a start, so learn this much, practise safe starting and tuning, and next lesson will cover mounting the engine in a model and setting up the fuel tank.

Keep your fingers out of the prop, wear a finger guard or use a chicken stick.

Ben Dover; Worm Examiner

Stiffen the crows; I almost forgot. Are you working on your model for the Oz T.O.C. (Tournament Of Champions)? It will be held next February, 1991, at UMAC field, and promises to be the ultimnate competition ever held in Oz for aerobatic flying. Minimum wing area is 1100 square inches for monoplanes and 1500 square inches for biplanes. The aim is for at least $10,000 in prizes and a spectacular event. BIG MODELS - BIG PRIZES - BIG EVENT. Old Fashioned Hobbies is tooling up for the event with an absolutely state-of-the-art kit of a type of construction yet to be seen in modelling that employs space exploration vehicle constructiion techniques. More details and pictures in the next Airborne. In the meantime, get building or planning. Ron Artis of UMAC is the base organiser, and you can get him on (02) 604 6978.

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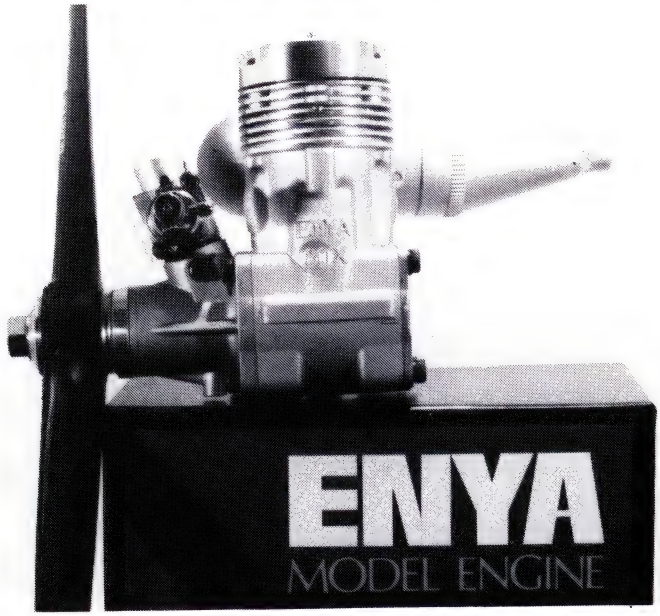
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42 MAPLE AVENUE, KESWICK, S.A., 5035

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Engine Review

ENYA 80XF



The Enya 80. Walk softly and carry a big stick. Looks like a 60 but swings a "big stick" with ease.

OUTLINE

Anybody who has been modelling for ten years or more would have to agree that the engines on the market these days are superb examples of precision engineering and performance. Possibly the hardest decision to make is which brand or type to purchase, as the popular names have little between them on all points. Occasionally a sparkler will crop up with a little more performance than the competition, and this will start a short-lived race to produce a little more 'go' in similar or marginally larger sizes outside the norm. An example of this is evident in 26, 46, 53, 65 and 70 size engines, which are a 'tad' larger or smaller than the more common sizes. It is easier to increase the capacity of an engine to gain a little more power than it is to go to expensive and complex performance modifications.

This also is evident in the world of full size motor cars. For a while we were inundated with treble grunkles, fortified frznans and triple turbo galactic blasters. Apart from the enormous insurance increases, some of the engines were a nightmare to work on, and a lot of users found they lacked good, old-fashioned, plain language guts. Many turbo fanatics learnt the old motoring adage 'there is no substitute for horses under the bonnet'.

The same holds true for model engines. Every once in a while a particular engine rises above its peers and grabs the attention of modellers due to some factor of its manufacture or performance. The Enya 80XF is such an engine. The engine is really a 60 XF-4 with three modifications. The bore is larger by 3 mm, with piston and ring to match, and the '60' designation in relief on the maincase has been machined out and replaced by a stamped '80'. I don't know whether Mr. Enya knew what the result would be or whether he just had in mind a low weight .80 engine, but I am prepared to wager that even he was surprised with the result. I was, and every modeller I know who has run one of these engines was also very surprised. I have heard several established modellers say exactly the same as I did when I first ran the engine: "It started right out of the box, and when I pulled the throttle back it was awesome." The prop figures are similar to several large capacity 4-strokers, but with them you expect a bit of a prop blast just by gauging their physical size. You certainly don't expect it from an engine half the size. Let's look inside this wondrous beast that scares bats out of belfries.

Castings

Alumnium alloy casting work would be at a peak of quality now, and it is difficult to consider any way it could be improved in the future. Any manufacturer with a thought to quality and sales would be flying a kite in a sandstorm if he didn't investigate the latest methods and metallurgy that produce the high standard the discerning consumer now expects. The modeller need have no qualms regarding the Enya cast work. High grade alloy, clean sharp casting dies topped off with superb machining, produces the typical quality that is evident the minute you open the box. I don't know what medium Enya employs for casting, but I do know that they don't use sand molds, and that the molds they do use are two-piece. Possibly permanent molds with pressure or centrifugal casting. Whatever the method, the end result is blemish-free, clean, sharp and lightweight.

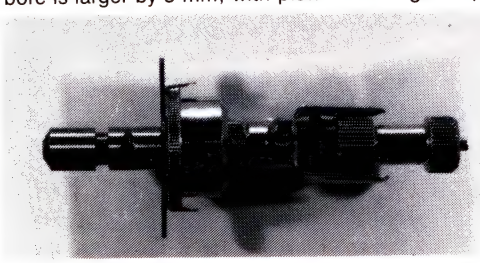
The maincase comprises the crankcase and barrel. Finish is a fine texture aluminium grey with the fins machined to give a high polish finish. The overall result has a very pleasing appearance. A separate rear housing and front shaft housing is used, and I am rather fond of this mode of manufacture for reasons of ease of assembly and disassembly, less costly replacements if one component is damaged and the added bonus of reverse running if desired for special models. Reverse running is accomplished by rotating the front housing 90° to the left when looking at the front of the engine. With a side exhaust engine the carburettor is now facing in the same direction as the exhaust. The front housing contains the two main bearings; the front one shielded on the open side, and the manifold for the carburettor. Directly under the manifold, on the underside of the housing, is a spigot cast into one of the strengthening webs. What is the spigot for? Think about it; I'll tell you later.

The head is cast with a brass insert for the plug and a 5 mm squish band sloping in towards the 17 mm combustion chamber bowl. Why do I mention these dimensions? It gives an indication to the engineering modeller who **understands** what he is doing that there is scope for head changes for higher or lower nitro fuel and a different performance from that available with the head as I stated. Of course, other changes to the engine will also be needed for a noticeable change in performance. The head seals directly to the liner; that is, no gasket is used.

Liner and Piston Assembly

The liner is hardened steel with a small flange that locates in the top of the barrel. The ports are angled for directional flow for gas swirl, and the boost port is angled up to place its cooling charge high above the exhaust port, the hottest part of the liner. There's more to the direction of porting than meets the eye. As can be seen, not only does the angling of ports have a great effect on the gas (mixture of fuel and air) flow, it can also be used to assist cooling the engine. If the angles are not complementary, the flow of gas is disturbed, and uneven burning can result. Another problem unique to our model engines is that, if a charge of gas is angled too acutely upwards, it can consistently cool the plug, giving indifferent running and no chance of a reliable idle. No worries with the Enya liner; they've got it all together.

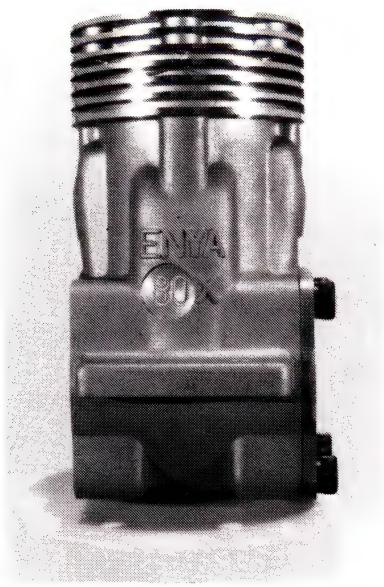
The piston is machined from bar stock and has a very high grade finish. Mr. Enya obviously intends this engine to last a long time, as he has fitted bronze bearings in the piston for the



Enya spraybar and throttle control is simple and has adjustable mid range; appears to be complex.



Main block of Enya throttle is relatively uncomplicated. Markings are for mid range adjustment!



The Enya 60 crankcase designed for strength and stresses of high performance. Embossed 60 removed and '80' stamped on.

gudgeon pin. This practice is rarely seen these days, and it certainly looks good; sort of feeling of confidence that this is one area that will take a lot of wear. The gudgeon pin is retained by wire circlips, as its up and down travel is directly in line with the fuel ports, and these would trip up rub pads up they were used. If you, for some obscure reason, as I have done and am telling you about it, pull the engine apart, be careful of the piston ring, as it is pinned in place to stop it from revolving. If you try to fit the piston to the liner without it locating on the pin you will end up with two pieces of piston ring, both of which will have the value of a hip pocket in a singlet.

The conrod appears to be a forging, and is fitted with bronze bushes both ends. Both the little and big end are drilled with three holes for lubrication that would have them swimming in oil, which is the main idea.

Crankshaft

Nothing unusual about the creankshaft; it is machined from one piece, all surfaces have a high grade finish, 17 mm main diameter, 11 mm bore, a sturdy big beast. The ... just a minute ... there **is** something different. No locking cone for the propeller driver! The 25 mm diameter drive disc fits the shaft over two flat surfaces; a sort of double D drive. I don't know why that method is used, but I can live with it. One thing for sure, you don't need a puller to remove the drive disc. Shaft thread size is 7 mm.

Carburettor

The engine is fitted with the new GM type carburettor, which means that it has a little extra bit (like boy jelly babies). The body is machined from bar stock with (my thoughts) 20 different machining operations that result in a very pleasing appearance in an engineering type of way.

The idle mixture is adjusted by an air bleed screw at the front of the body, so remember, an air bleed carby chokes best when fully open. Throttle stop for adjusting idle speed is on top of the carb, and this is its only function. Usually this screw also does the job of retaining the throttle barrel, but not in this case.

Minimum end-play is a must with the fourth control, so a retainer yoke is bolted on the end of the body to prevent side movement. On the top of the body, at the main needle end, are 5 orange lines and a + and a – sign. This is the fourth control - mid-range mixture. In the needle end of the hardened steel throttle barrel is a bronze bush running just into the throat. Inside this bush you can see an oval slot approximately 1.5 mm wide by 5 mm long. The steel spraybar, which is independent of the threaded section of the spraybar where the needle screws in, has the normal hole at the end. Back from that about 7 mm is a groove and a hole, and next to that is a crescent cut and a hole. These latter two line up with the groove in the bush. That part of the spraybar pushes on to the rest of the body with an O ring seal. Around this section is a cap with a knurled ring. The knurled ring controls the movement of the spraybar by the spring clips attached to it. In operation at full throttle a charge of fuel travels straight down the spraybar and out the end. This is assisted by a secondary flow out the crescent hole, along the groove in the bush, down into the circular groove in the spraybar, into the hole and there it joins the main flow to give the correct mixture, as set by you with the main needle for the airflow. As the airflow decreases with the throttle barrel closing, less of the crescent is in line with the groove so the fuel volume decreases. If necessary, a little snick either way with the adjusting lever and you have a tuned mid range with no lumpy bits.

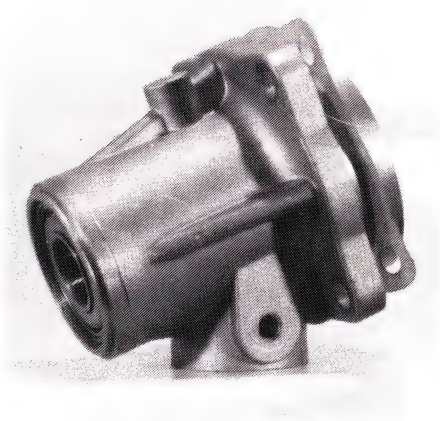
The needle itself is very acutely tapered, and the thread is fine. This combination gives very easy tuning even with all synthetic oil fuel mixes. You will also notice a neat rubber boot on the needle barrel which keeps out rubbish, protects the threads and gives protection against air leaks. All together, a very successful carby, easy to tune for all ranges, smooth in operation and sparkling transition. With a 10 mm bore in the barrel, muffler pressure is advisable if you want to fly anything other than level.

SPECIFICATIONS

Bore:	**27 mm**
Stroke:	**22 mm**
Displacement:	**12.6 cc**
Weight, with muffler:	**570 g**
RPM range:	**10,000 to 17,000**
Idle:	**2,500 to 3,000**
Piston and Liner:	**Aluminium with ring-steel**
Carburettor:	**Enya GM: 10 mm bore**
Glow plug (rec):	**Enya 3 or 4**
Propeller range:	**11 x 7 to 14 x 8**
Fuel:	**18-20% castor or synthetic/ methanol/5-20% nitro**
Model use:	**4 to 6 kg (depending on wing)**

Muffler

At first appearance, the muffler is the normal Enya expansion chamber type unit, but a close scrutiny reveals a little extra bit (as previously; little extra bit) on the manifold. As well as the usual method of attachment with two bolts



Enya crankcase bearing and throttle seat. What is that bottom spiggot (actually on top) for?

straight to the engine manifold, Enya also supplies a strap type muffler clamp. The choice is yours; I like both methods, but whatever you choose, include the supplied manifoled gasket. Not only does it provide an efficient seal. it also assists in cooling the engine.

The muffler is a two-part unit than can be separated, and the new mute section added. I was told straight from the horse's mouth that this mute is a copy of the muffler design I gave you some time ago, and claims of 75 dB are being bandied around. That ought to be worth a million dollars or so to the Winch retirement fund. Well, at least I'm going to keep the engine, so I suppose that's better than a poke in the eye with a burnt stick or a slap in the belly with a wet fish.

The Song Sung

Well, there are only a few cap head screws left in the box, so I suppose we have looked at all the bits. Let's see how the brute performed. All prop tests were done with the engine running on Magnum standard 4:1 fuel because it's good stuff. A short test was conducted using a low ratio synthetic oil fuel to evaluate the tuning. Tuning remained as set over three clicks on the ratchet which, for those of you who haven't had problems is very good. No plug was supplied, so what did I use? A Taipan green, of course; good Aussie gear.

Now let's hear the song.

Master 14 x 8	8,500
Kavan 12 x 11	9,250
Master 13 x 8	9,200
Master 16 x 7 (antique style)	6,500
Top Flite 12 x 8	10,250

Best idle was a dead smooth 1,500 with absolutely magic transition to top rpm. A two-stroke mid range was simple to obtain, and starting was as ready and quick as the handshake of a good friend. A very impressive engine that is gaining popularity in rapid strides.

The spigot? Of yes ... it can be drilled and tapped for a nipple if you want real timed pressure for high performance use. Remember, this is all positive pressure and it could blow up a tank. Use it only if you have a positive need and know how to use it.

Test engine was supplied by Model Flight of Liverpool, and yours is waiting for you in any good hobby shop.

TEST REPORT — Hamg Shing Drill

by Brian Winch

Chuck capacity:	10 mm
Speeds:	250 to 600 rpm
Overall length:	240 mm
Weight:	0.9 kg
Recommended Use-Load	
Steel:	6.5 mm
Wood:	15 mm
Screwdriving (max):	6 mm

How do you rate Taiwan as a manufacturing power? Perhaps a few transistor radios and the like, maybe a limited range of tools and copies of well known model engines? How about the tired cliche "an emerging industrial nation"? Think again! While some of us have been resting on our laurels, they have been selecting the best, culling the features, adding their own ideas, and producing some pretty sharp merchandise. Okay; so they copy. Who doesn't? Do you think that an artist draws a tree completely from his imagination? Do you want to re-invent the wheel? It takes either a very brave or foolish manufacturer to produce an entirely new product without thought of future markets. A product sells, it is of good quality and the market will be available for a long time so, get a piece of the action; build a better mousetrap or ... one that is just as good but for a lower price.

This is where Hamg Shing enter the picture. Battery operated hand tools are the buzz, everybody is getting in on the act and we have some good ones and some not so good. Some are very heavy, some so poorly balanced that you feel like you have been using a brickies maul all day, and some will just not fit the human hand, no matter how you hold them. The Hamg Shing think tank must have been buzzing for quite some time while the designers tried and tested the many types to select the ultimate shape and the required features. Their final selection was, no doubt, also influenced by the share of the market held by the selected tool which is easy to recognise in the copy.

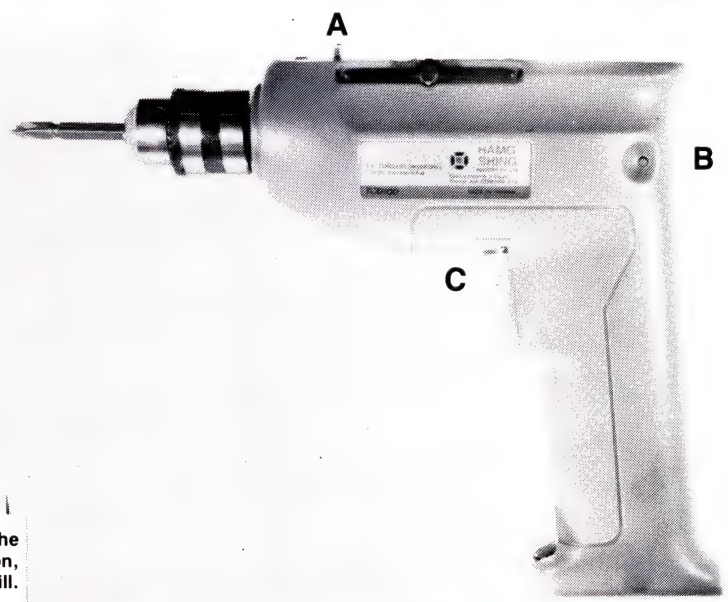
The polycarbonate, glass re-inforced body is of superb finish, tough, and comfortable to handle. The two-speed control, reversing switch, overload button and trigger are easy to operate and accessible, and the chuck key is secured slightly better than on the copied drill.

The question to be asked is, what is hidden in the case? First off, the eight body-securing screws are standard Phillips head, so no fancy gadgets are required to open it. All internal components are firmly located in formed beds, so nothing jumps out at you when you remove one case half. The overload-protected motor is a 500 type 7.2V, which is of good design and slightly larger than is usually found in this size drill. Gears are carbon steel with superb tooth shape and overall finish, which accounts for the general lack of mechanical noise. (Store in mind for future reference when some fine toothed gears are needed for a modelling project. Whirr - click - click - fzzzzt - stored under Gears; the use of.) The whine you hear is from the high speed reduction gearing on the motor, which is to be expected from spur gears of such ratio. All shafts run in sintered bearings with the exception of the final output to the chuck, which is supported by a 25 mm, sealed-front ball race. The main trigger and reverse switch are in one modular unit, and the battery pack is inserted into the handle after charging. All components are available as single items if ever you should need replacement parts.

The 240 V charger supplied is DC7.2V - 1.5A output, which will charge a flat battery to full capacity in one hour. Charging in progress is indicated by a red LED. Full charge of the battery is checked by a heat sensor in the charger, so you might have to wait a few minutes before it



The battery for the drill with polarity clearly shown. Position D is the heat sensor contact for regulating the charger supplied with the device.



***Hamg Shing drill*, the modeller's ideal companion in the workshop or on the field, even in the rain. Point A is the gear change, B is the overload button, C is the forward-reverse switch. Bit in the chuck is supplied with the drill. How about an attachment for starting engines?**

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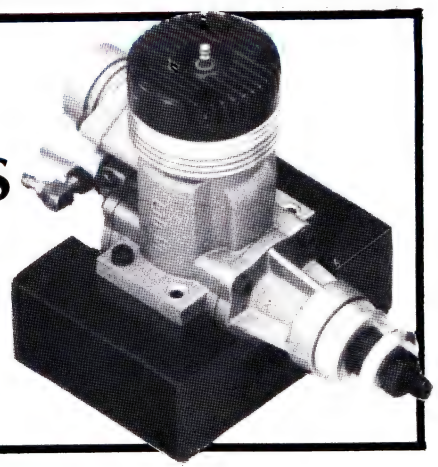
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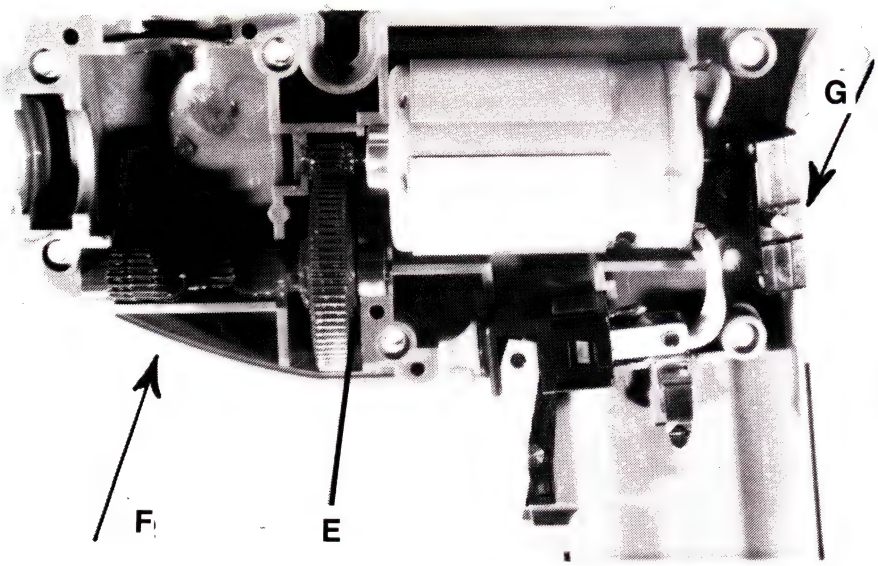
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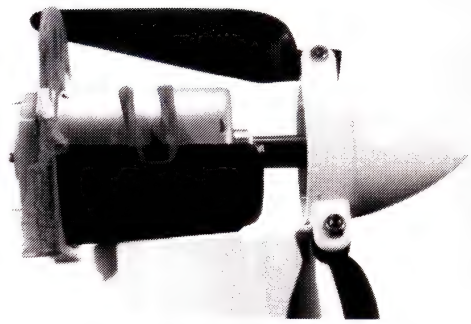
Primary drive, E, and secondary drive gears, F, are neat and accessible. Replaceable, modular components available as spares. G is thermal overload cut-off switch.

will charge a discharged, hot battery.

Well, apart from the cross head-Phillips head screwdriver supplied (very handy), that's all there is in the box other than the comprehensive instructions, so let's check the performance.

On test the drill proved to be quite a match for its competitors in both power and endurance. I gave up after drilling 105 x 4.5 mm holes in a bit of scrap 14 SWG steel, as the drill still had a bit of life left but the test was infringing on smoko time. The ultimate test came with the battery recharged (long smoko), when I had a need to drill a 13 mm hole right through both sides of a 75 mm galvanised pipe. With a 6 mm pilot, the drill was not showing any signs of stress, and handled the job well. This use is not recommended, but it was an interesting test.

A quality hand tool that will fit into the tool box of the tradesman and handyman with ease, and will hold its own against all-comers.



Hamg Shing drill motor is same diameter, but 8 mm longer than usual 450 motors. A standard 450 gave 6,500 rpm with a 9 x 8 folding prop on 9.6 Volts, and the drill motor gave 8,000. Very interesting.

Odd point: the name is Hamg Shing, the chuck is Jacobs.

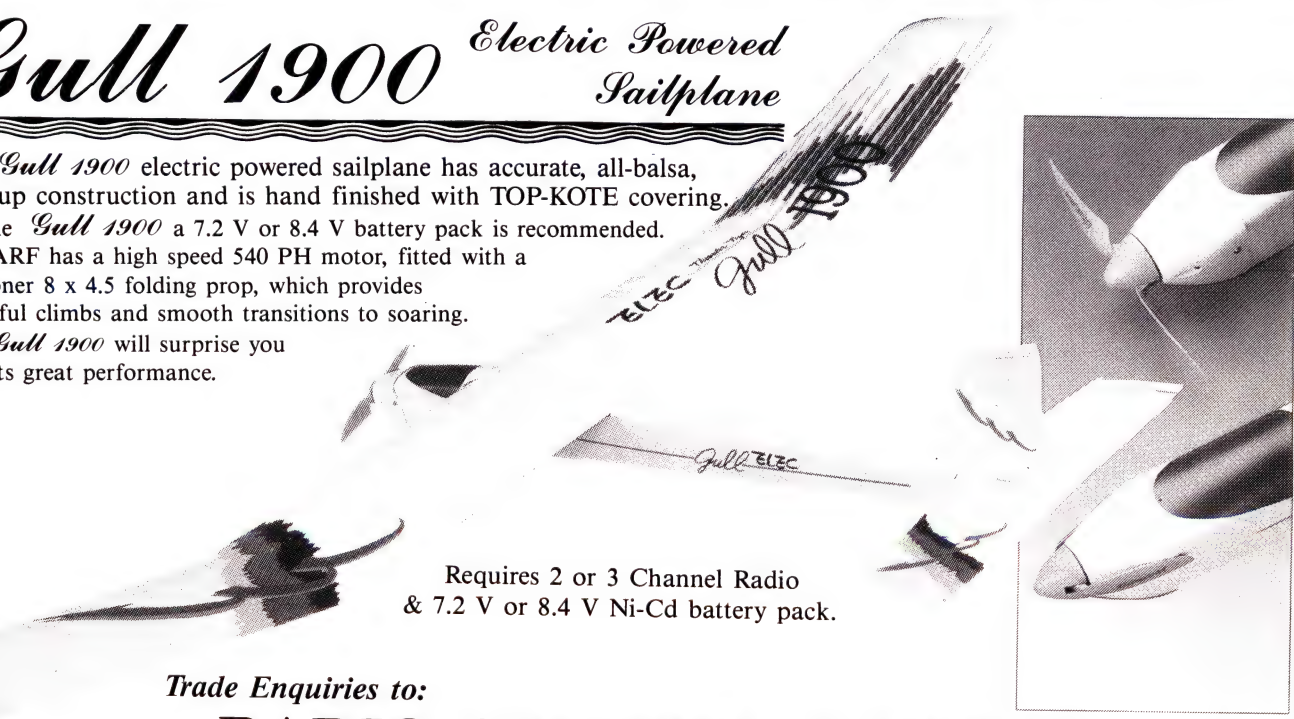
Product test conducted by Brian Winch, Airborne Engin-ear, purveyor of precision miniature engineering equipment.

FOOTNOTE. This drill is the ideal tool for modellers, both in the workshop and at the field. Apart from its uses as is, many components could be adapted to modelling use, such as the gears and motor. Using the motor with the overload switch fitted in an aircraft would negate the need for a fuse, as a stalled prop would cause the switch to cut the motor before any electrical damage was done. The price of the unit is the lowest of all comparable battery drills, and you can see the one you will purchase at Hobby Headquarters, Kirrawee.

Drill for testing supplied by Cavian Imports.

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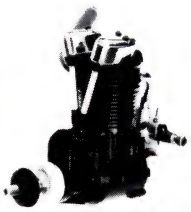
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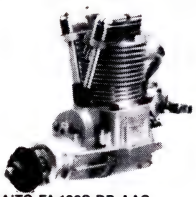
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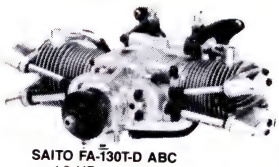
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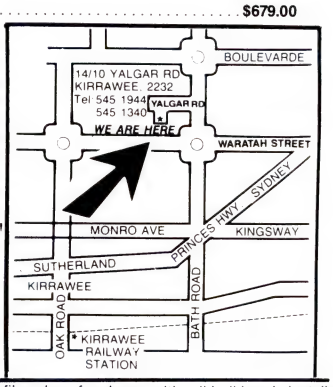
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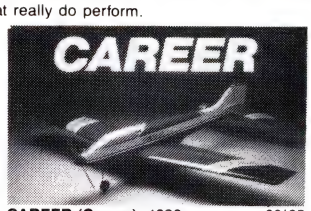
Sport Sizes	Competition Sizes
5.7 x 3	8 x 8
6 x 3	8 x 9
7 x 6	8 x 10
7 x 7	8 x 12
7 x 8	8.5 x 4.5
7 x 9	10 x 6
7 x 10	10 x 7
8 x 4	10 x 8
8 x 5	10 x 9
8 x 6	10 x 10
8 x 7	11 x 6
8 x 8	11 x 7
8 x 9	11 x 8
8 x 10	11 x 9
8 x 11	12 x 6
9 x 4	12 x 7
9 x 5	12 x 8
	11 x 10
	11 x 11
	11 x 12
	11 x 13
	11 x 14
	12 x 9
	12 x 10
	12 x 11
	12 x 12
	12 x 13
	12 x 14
	11 x 12W
	12 x 10W
	13.5 x 12.5
	14 x 8
	14 x 14

THE HOBBY HEADQUARTERS is the Factory-Appointed Distributor of ADVANCED PRECISION COMPOSITE ROPELLERS
TRY ONE! You won't use anything else!
Price similar to other brands.
DEALER ENQUIRIES WELCOME

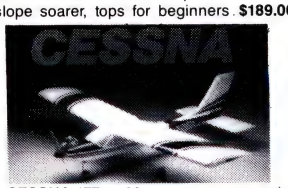
FUNKEY KITS. Superbly finished, lightweight, fibreglass fuselages with: all bulkheads installed; engine mount installed; wings and stab balsa sheeted foam with leading and trailing edges fitted; all flying surfaces cut out and shaped; hardware, including wheels and tank, supplied (except in ¼ Scale Cap 21). True ARF kits that really do perform.



SKYRANGER: 1830 mm span, thermal or slope soarer, tops for beginners. **$189.00**



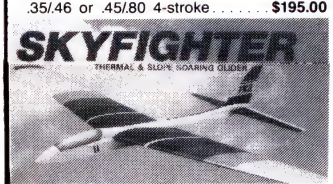
CAREER (Curare): 1630 mm span, .60/.65 sport/pattern, retract **$299.00**



CESSNA 177: 1430 mm span, sport-trainer, .35/.46 or .45/.80 4-stroke..... **$195.00**



¼ SCALE CAP 21: 2120 mm span, 1.2/2.4 or 2.4/3.1 4-stroke **$529.00**



SKYFIGHTER: 1750 mm span, thermal or slope soarer, brilliant performer.. **$195.00**

JETSTAR: 1500 mm span, sport/pattern, .40/.46 or .65/.91 4-stroke..... **$239.00**



SPEEDA ,60 (Super Blue Angel): 1600 mm .60/.65 sport/pattern, retract..... **$299.00**

ARCOMASTER .40 (Arrow): 1400 mm span sport/pattern, .40/.46 ..... **$245.00**
.60 Size: 1600 mm span, retracts **$335.00**

PHOENIX .40 (Magic): 1420 mm span, spart/pattern, .40/.46 ..... **$245.00**

YELLOW AIRCRAFT: These magnificently finished, almost-ready-to-fly aircraft consist of pre-built fibreglass fuselage and balsa sheeted foam wings, with leading and trailing edges fitted. Full instruction manual. The CAP 10B has firewall and bulkheads installed, fibreglass cowl and wheel pants, preformed heavy duty landing gear, vacuum formed clear canopy, built by Funkey ..... so you know it's good! Full 'French Connection' decal set included.



CAP 10B: span 75 inch, 980 sq inch, 13-17 lb, 1.20 4-stroke **$599.00**

1/9 Scale F-16A FALCON: Span 44 inch, length 67 inch, 8½ to 10 lb, Pre-moulded intake and exhaust ducts, pre-cut ply bulkheads, glass moulded ventral fins, heavy duty aluminium yoke and nylon bearing for elevator, vacuum formed clear canopy **$659.00**



DOUGLAS A4 SKYHAWK: 40 or 45 inch span, 580 or 653 sq in., accepts Dynamax fan, separate access hatch, pre-moulded fibreglass ducting and gear pods, precision pre-cut ply bulkheads **$499.00**

1/10 Scale F4E PHANTOM II: span 43.5 in., length 68 inch, 9-11 lb, Fuselage has scale panel lines, recessed glass for hatches, all formers pre-cut, scale stabilator, dropped LE on pre-sheeted dihedral tips, glass ducts with bifurcated exhaust,, exhaust cones with turkey feathers, glass splitter plates, vacuum formed clear canopy, takes a 5 inch fan, no cheater hole required. Single fan. **$739.00**



COMBO SPECIAL: Take any Yellow Aircraft Ducted Fan kit and we will include:
Dynamax Fan, OS 91 VR DF ABC Engine and Spring Air Retracts, for an additional $799.00

BALSA
HHQ AAA GRADE MICRO CUT, Sizes Approx

	75 x 915	100 x 915	100 x 1220
0.8 mm	$0.67	$0.92	$1.50
1.5 mm	$0.67	$0.92	$1.50
2.5 mm	$0.82	$1.13	$1.88
3.0 mm	$0.98	$1.32	$1.99
5.0 mm	$1.27	$1.72	$2.53
6.5 mm	$1.42	$1.87	$2.85
8.0 mm	$1.57	$2.52	$3.40
9.5 mm	$1.98	$2.87	$4.57
12.5 mm	$2.42	$3.27	$5.75
19.0 mm	$3.22	$4.32	$8.45
25.0 mm	$3.92	$5.27	$10.98

NO MINIMUM
Balsa Orders over $200 Freight FREE!!

DREMEL FREE WHEELER

2 Speed Cordless Moto-Tool with keyless chuck. Ideal for any modeller.

Retail: $145.00
SALE **$96.00**
Ask us about our special bag of accessories for the Free Wheeler at SALE PRICE.



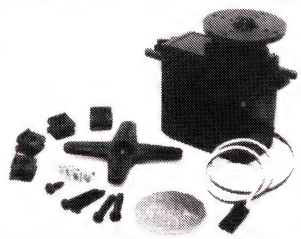
SERVOS
HHQ STANDARD Size Servos
Suit most RC sets. State connector required.
$21.95 each; or 4 for **$79.95**
Japanese Mfr HHQ Micro Servo
12.5 x 31 x 29.5 mm; 1.4 kg-cm torque; 19 gm; connector suits most RC sets;
$56.50 each; or 3 for **$159.00**
Available with metal gears and ballraced output
$62.95 each; or 3 for **$179.00**

JR 507 SERVO
Suit most RC systems, 2.9 kg-cm torque, .27 sec/60°, 46 gr



$36.95; or 3 for **$99.00**
or 6 for **$174.00**

HHQ H/DUTY SERVO
12 kg-cm torque; ideal for large scale aircraft, boats, cars etc., complete with horn, mounting rubbers, ballraced output, 112 gr.
Intro special **$59.00**



K & B ENGINES

MARINE ENGINE SUPER SPECIALS

K&B 3.5 cc Outboard Marine	**$199.00**
K&B 7.5 cc Outboard Marine	**$259.00**
K&B 6.5 cc Inboard Marine	**$149.00**
K&B 11 cc Inboard Marine	**$359.00**
K&B 20 RC Sportster	**$79.00**
K&B 45 RC Sportster	**$105.00**
K&B 40 RC (Ball Bearing)	**$129.00**
K&B 61 RC (Ball Bearing)	**$159.00**

THE HOBBY HEADQUARTERS is the Factory Supplied and Appointed Distributor for K&B Products. Our Spare Parts back-up is building rapidly
Our 'Labour Free' repair facility applies.

BATTERIES

500 mAh Cells, Saft or National	**$2.95**
500 mAh Cells, Saft tagged	**$3.59**
700 mAh Cells, Saft tagged	**$4.89**
1300 mAh Cells, Sanyo KR 1300 SC tagged	**$7.89**



Need a new receiver or transmitter nicad pack? Select any of the above tagged cells and multiply by the number of cells required, add $7 for receiver packs and $12 for transmitter packs. All packs heat shrink covered, with leads. Just add your own connector, or we will fit for a little extra.

12 volt, 6.5 Ah cell..... **$44.95**
and with charger **$69.95**

RADIOS

Futaba Bionic Gold 2 Ch Reversing, 2 servo, 29 MHz, AM	**$99.00**
Sanwa Dash 2 Ch Reversing, 2 servo, 29 MHz, AM	**$95.00**
Hi-Tec 455, 4 Ch, 3 servo, Dual Rates, Reversing, 36 MHz	**$179.00**
with nicads and charger	**$259.00**
Hi-Tec 455 PCM, 4 Ch., 3 servo, Dual Rates, Rev, Nicads, 36 MHz	**$315.00**
Hi-Tec 550 PCM, 5 Ch, 4 servo, 36 MHz, Dual Rates, Rev, Nicads	**$385.00**
Hi-Tec 720, 7 ch., 36 MHz FM, 4 servos, Dual Rates, Rev, Mixing	**$345.00**
or with Nicads	**$398.00;**
or with Nicads and Charger	**$424.00**
Futaba Attack 4 Ch, 36 MHz FM, 3 servo, Reversing	**$275.00**
or with Nicads and Charger	**$355.00**
Futaba Attack 4 Ch, 29 MHz, 3 servo, AM, Reversing	**$199.00**
or with Nicads and Charger	**$279.00**
Futaba Conquest PCM 5 Ch, 36 MHz, Dual Rates, Rev, 3 servo, Nicads, Charger	**$529.00**
Futaba 7UAP, 7 Ch, PCM, 36 MHz, 3 x 3001 servo, mixing, rates, rev, memory, nicads and charger, computer readout	**$779.00**
JR 5 Ch MAX, 36 MHz, FM, dual rates, reversing, 4 x 507 servos, nicads and charger	**$469.00**

The easiest to apply and most durable EPOXY PAINT AVAILABLE
K&B SUPER POXY PAINT — for the "Ultimate Finish"
A development of the space age, Super Poxy Paint is formulated exclusively for models ... mix and use (NO WAITING TIME — NO HAND RUBBING). Fast curing and quick drying, it sets up rapidly for minimum dust adherence. Stays glossy longer, least affected by ultra-violet sun rays or manufactured fuels.

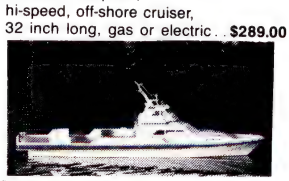


FOURMOST RECOIL TUBING
A 6 ft length of super tough, fuel-proof urethane tubing preformed into a coil. Allows placement of your field box and fuel can a convenient distance from your aircraft or boat. After use the tubing will retract to its earlier space-saving form. The tubing will withstand gasoline and diesel as well as glow fuel. 1/8 inch ID. Cat. No. 135.
Retail: $14.95; SALE **$9.95**



***DUMAS BOATS**
from the 'Model Boat People'
These superb wooden and glass kits offer excellent value and high performance.....

Deep Vee 40; 32 inch long for .40 inboard marine	**$139.00**
Shelley Foss Tugboat; 36 in. long for gas or electric	**$259.00**
American Enterprise; hi-speed, off-shore cruiser, 32 inch long, gas or electric	**$289.00**

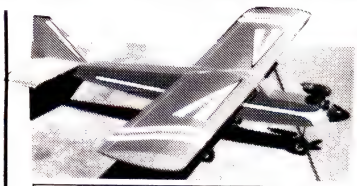


PT 109; WW2 Torpedo Boat, 48 inch long, 12¾ inch beam, gas or electric, features hand laid-up glass hull and clean die-cut plywood decks and superstructure	**$599.00**
Hot-Shot IV; 29 inch long for 3½ outboard	**$139.00**
Miller American; 1/8 scale hydro, 43 inch long, .60/.67 engines	**$359.00**

PNEUMATIC RETRACT AIR PUMP
With Gauge. Suits all makes.



Retail: $79.95 SALE **$54.95**



BEGINNERS' SPECIAL
Futaba 4 Ch Attack 36 MHz AM
with Rev, Nicads, Charger, 4 Servos
+ K&B 40 RC Ball Raced Engine
+ Pricerite Western Trainer Kit
$499.00

SPRING AIR RETRACTS
Lock down if air is lost. Accessories available.



Trike Firewall or Belly Mount	**$220.00**
or with above pump	**$270.00**
Trike Slimline (No. 301 fits in 26 mm deep wing)	**$220.00**
or with pump	**$270.00**
Mains Only	**$169.00**
or with pump	**$219.00**

AIRCRAFT KITS
Check Our New Arrivals .... and Super Discount Prices!!!

PRICERITE

Too-Up; CL, 910 mm span, .10-.20,	**$44.95**
Electric Powerhouse; .05, 1354 mm	**$69.96**
Electric Flash; .05, 1013 mm span	**$69.95**
(The above 2 electric models could use 10 FSR or 26 4-stroke engines)	
Quiet Advancer	**$64.95**
Western Trainer 40	**$105.00**
Red Zephyr	**$89.95**
Buzzard Bombshell	**$89.95**
Playboy Senior	**$89.95**
Powerhouse	**$109.95**
Trenton Terror	**$82.50**
Simplex	**$72.50**
Pronto; 1500 mm span, .40/.45	**$114.95**
Fun Fly; 1422 mm span, .25/.40	**$61.95**
Sequel 2000; 2M comp. sailplane	**$109.00**



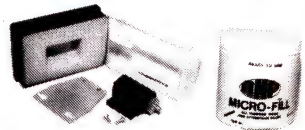
Available Now
DYNAMAX FAN
.60/.90 engine, 10 lb static thrust, 170 mph exhaust velocity.
$219.95

ACCESSORIES

Perry Oscillating Pump	**$46.50**
Perry Regulating Pump	**$51.50**
NEW ITEM PERRY REGULATING PUMP: Gas/Diesel or **Smoke Fluid!**	**$51.50**
Hi-Point Boat Prop Balancer	**$44.90**
Heavy Duty Wire Bender; 10 mm steel with Hi-Tensile steel studs, bends up to 4.75 mm spring steel, including coils	**$29.95**



NHP Wood & Styrofoam Filler; 8 oz., screw top tub **$7.95**



Sullivan 601 Heavy Duty Starter	**$69.00**
Thunder Tiger Heavy Duty Starter	**$46.95**

Dave Brown 6 Shooter Glow and Diesel Pumps..... **$23.50**



Bruline Air Filters; Fine or Course. **$6.50**

Replacement Filter Elements **$5.95**

LUBRICANTS & FUEL ADDITIVES

Klotz Techniplate Racing Oil; 5 lt. **$49.95**
Castrol M 1st Pressing Castor Oil;
4 Litres..... **$24.50**
5 Litres..... **$28.95**
Synlube Synthetic Oil; 500 ml..... **$8.50**
Synlube Synthetic Oil; 5 Litres... **$74.95**
Nitromethane; 1 Litre..... **$22.00**
Nitromethane; 2 Litres..... **$42.00**
Nitromethane; 5 Litres..... **$99.00**

All the above available in bulk: 20 Litre or 205 Litre — call for Quote



Australian made, high quality aluminium spinners: 1½ inch to 6 inch diameter, to suit any engine. Custom made contours available at very reasonable cost.
Custom made cowls also available.



Full House Adjusto-Jig; wing and fuselage jig complete.
Must-Have Item..... **$159.00**

PURCHASE ANY GREAT PLANES or ACE KIT and receive a FULL HOUSE A-JUSTO-JIG for..... $139.00!!
(Special offer available only while current stocks last)

Plug Wrench; socket fits neatly over plug. Ideal for cowled engines
Screwdriver type handle..... **$13.90**
Chromed Modellers' Wood Plane, - not a razor plane. High speed steel blade. You'll never use a razor plane again.
..... **$22.95**





L.R. Taylor Power Pacer Auto Battery Cycler & Charger **$189.00**

NEW ITEMS!!

*Glass Cloth; Ultra light weight; - ***0.6 oz.,*** 38 inch width, per metre..... **$10.95**
*Willhold RC 56 Canopy Glue; 4 oz **$5.99**
*Dynaflite 2M Upstart Short Field Glider Launch Kit..... **$64.95**

Jet Pilot Kit*





BUST PILOT KIT

This is the lightest bust pilot available. It can be assembled as either a Sportsman or Barnstormer.

*DGA Pilots: 1/8 to 1/3 scale, bust & full bodied; jet and sportsman busts, full bodied sportsman or barnstormer. Ultra light weight, minutely detailed. ***Very reasonably priced.***

*Bruline Waterproof Switch; no boat enthusiast should be without... **$19.95**

*KHP Flex-Mask; an ultra flexible masking tape, lays flat around ½ inch radius curve, extremely thin, low tack, comes in 108 ft roll,
1/8 inch wide for small models.... **$5.99**
1/4 inch wide..... **$7.79**

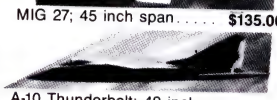
SALE!!!! *TOP FUN*

*Combat Models;, full range available, limited stocks. These high performance slope soarers are fantastic:

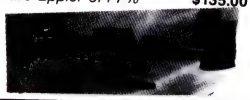
A4 Skyhawk; 43 inch span.. **$135.00**



MIG 27; 45 inch span..... **$135.00**



A-10 Thunderbolt; 49 inch span. *All have Eppler 374-7%* **$135.00**



***SUPER HIGH PERFORMANCE SAILPLANE COLLECTION:**

These superb high quality sailplanes are by Bob Sealy and feature magnificent epoxy glass hand laid fuselages, precision cut foam wing cores, balsa sheeting and building instructions.

A 1/8 scale slope soaring plane that is a ball to fly. The kit features a fiberglass fuselage and foam core wings that are to be balsa covered by the builder. Wings are detachable for ease of transportation. Specs. are 44" wingspan; 300 sq.in. of wing area, and a flying wt. of 24 ounces. The Komet may also be fitted with an electric or glow engine for flat land flying.



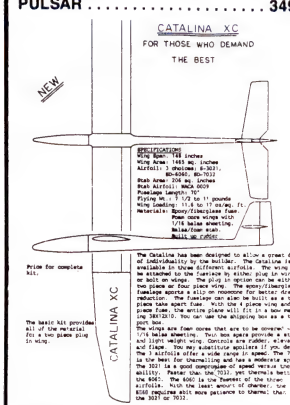
MESSERSCHMIT ME 163 .....$165.00



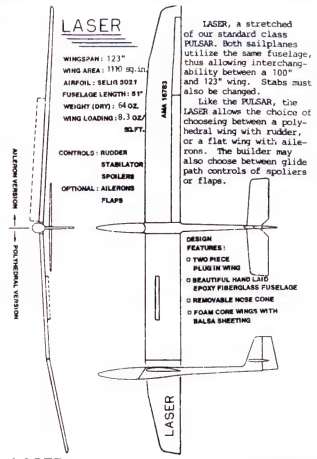
PULSAR, a standard class version of the ever popular ULTIMA. The PULSAR brings together today's technology and combines it into one complete, refined design.
PULSAR allows the choice of choosing between a polyhedral wing with rudder, or a flat wing with ailerons. The builder may also choose between glide path controls of spoilers or flaps.

The PULSAR is the answer to today's question about which standard class plane is the plane for you.

PULSAR..... 349.00



CATALINA XC..... $579.00



LASER, a stretched of our standard class PULSAR. Both sailplanes utilize the same fuselage, thus allowing interchangability between a 100" and 123" wing. Stabs must also be changed.
Like the PULSAR, the LASER allows the choice of choosing between a polyhedral wing with rudder, or a flat wing with ailerons. The builder may also choose between glide path controls of spoilers or flaps.

LASER..... $379.00

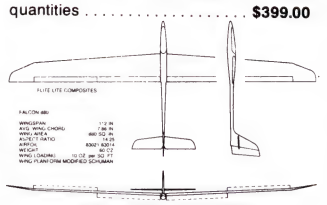
ACE KITS

4-20; 1232 mm, .15/.20, .20 4S.. **$109.00**
4-40; 1448 mm, .20/.40, .40/.45 4S **$129.00**
4-40 Bipe; 1219 mm span, .35/.40 or .40/.50 4-stroke..... **$159.00**
4-60; 1778 mm, .40/.46, .60/.90 4S **$169.00**
4-60 Bipe; 1473 mm span, .60 or .60/.90 4-stroke..... **$229.00**
4-120 Bipe; 1778 mm span, .90/1.08 or 120 4-stroke..... **$339.00**
Sport T-34; 1423 mm span, .35/.46 or .45/.65 4-stroke..... **$145.00**
1/6 Scale Cap'n'Eddy Pilot..... **$15.70**
1/4 Scale Cap'n'Eddy Pilot..... **$22.95**

GREAT PLANES

Sportster Bipe .40; 45 inch span, .35-.45 or .45S-.65 4-stroke.... **$159.00**
Super Sportster .60; 61 inch span, .45-.61 or .65-.90 4-stroke..... **$179.00**
Super Sportster 90/120; 72 inch span, .60-.91 or .90-1.20 4-stroke.... **$215.00**
Super Aeromaster Bipe; for .65 to 1.20 4-stroke..... **$225.00**

***Falcon 880 by Flite Lite Composites** is a semi-kit comprising exquisite glass fuselage, foam cores.
This RCSD Challenge winner, brilliant for multi-task, is now available in limited quantities..... **$399.00**



3-VIEW OF THE FALCON FROM FLITE LITE COMPOSITES.
WINNER OF THE RCSD CHALLENGE

BALSA USA

Smoothie; 52 inch span, .40/.50, fast and fully aerobatic..... **$99.00**
Taube; WW1 stand-off scale 62 inch span, .35/.50 or .40/.65 4-stroke..... **$99.00**
Bristol M1; WW1 fighter, 62 inch span, ABS cowl and spinner, .40/.60 or .65 4-stroke..... **$119.00**
Easy 100 Trainer; 70 inch span, easy to build and fly, .40/.60 or .40/.65 4-stroke..... **$149.00**
EAA Bipe; ¼ scale, 60 inch span, .50/.80 or .60/.90 4-stroke, ABS cowl, decals, 3-views.... **$169.00**
Citabria Aerobatic Pro; 80 inch span, Al gear, ABS cowl, wheel pants, .60/.90 or .90/130 4-stroke..... **$249.00**
J3 Cub; ¼ scale, 108 inch span, ABS cowl, Cub decals, .90/2 cu. in., or 130 twin..... **$269.00**
Piper L-4 'Grasshopper'; WW2 Obs aircraft, ¼ scale, 108 inch, ABS cowl, hardware, .80/2 cu in or 120/240 4-stroke **$289.00**
Phaeton II Bipe; 52 inch span, decals, 'N' struts, ABS cowl, .40/.60 or .65/.80 4-stroke..... **$129.00**
Phaeton 90 Bipe; 70 inch span, fast build, great performer, .90/130 4-stroke **$229.00**
Sopwith Pup; ⅓ scale, 108 inch span, 2.2/3.7 cu in, al cowl & hardware **$469.00**
Der Jager D IX; ⅓ scale bipe, 80 inch span, 2.2 cu in & up, ABS cowl, pants and aft deck, al gear..... **$439.00**

AA INDUSTRIES (was Bud Nosen)

Aeronca Champ; ¼ scale, 108 inch span, 130 twin 4-stroke..... **$239.00**
Gere Sport; ¼ scale, bipe, 96 inch span, Quadra or 300 twin 4-stroke.. **$329.00**
Mr Mulligan; ¼ scale, 96 inch.. **$339.00**

OLD FASHIONED HOBBIES

Limited Stocks: Playboy Senior, Buzzard Bombshell, Dallaire 50% & 75%

PICA

Spitfire Mk 9; 1651 mm span, .60 or .65/.80 4-stroke..... **$239.00**
FW-190 D-9; 1651 mm span, .60 or .65/.80 4-stroke..... **$259.00**
T28-B; 1651 mm span, .60 or .65/.80 4-stroke..... **$248.00**
Waco YMF-3 Bipe; 1524 mm span, .60 or .65/80 4-stroke..... **$269.00**
Cessna 182; 1829 mm span, .60 or .65/.80 4-stroke..... **$268.00**
Cessna 182; 1/5 scale, 86 inch span, .90/.120 or .90/160 4-stroke.... **$399.00**
T28-B; 1/5 scale, 80 inch span, .90/120 or .90/160 4-stroke.... **$399.00**

SIG

Kadet Senorita; Trainer, 1600 mm span, .15/.25 or .21/.40 4-stroke..... **$99.95**
Kadet Mk2; Trainer, 1454 mm span, .25/.46 or .45/.65 4-stroke..... **$138.00**
Kadet Senior; 'Hands-Off Trainer', 1982 mm, .29/.40, .35/.50 4S.. **$144.00**
J3 Cub; 1803 mm span, .25/.40 or .40/.50 4-stroke..... **$142.00**
Clipped Wing Cub; 1422 mm span .25/.40 or .40/.50 4-stroke..... **$142.00**
Kougar Mk2; 1270 mm span, foam wing, .40/.50 or .65 4-stroke..... **$148.00**
Kobra; 1143 mm span, .19/.35, or .40/.50 4-stroke..... **$105.00**
Smith Miniplane; 1118 mm span, bipe, .40/.45 or .45/.65 4-stroke..... **$178.00**
Mustang 450; Pylon Racer, 1258 mm span, .40 ..... **$148.00**
Liberty Sport Bipe; 1448 mm span, .60 or .65/.80 4-stroke..... **$227.00**
Astro Hog; 1803 mm span, *'Nothing flies like a Hog!'* .40/.60 or .60/.80 4-stroke..... **$189.00**
Skybolt Bipe; 1296 mm span, .60 or .65/.80 4-stroke..... **$219.00**
Ryan STA; 1829 mm span, .60 or .65/.90 4-stroke..... **$279.00**
King Kobra; Sport/Pattern, 1474 mm .60 or .80/.90 4-stroke..... **$189.00**
Riser '100'; 2540 mm span, Sailplane, Eppler 205, 1000 sq in floater. **$125.00**
Citabria; Sport Scale, 1753 mm span, .35/.50 or .45/.65 4-stroke..... **$215.00**
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ELECTRIC FLIGHT

by Phil Stevenson

Rules, Reports and Reviews — All Current!

With the interplay of managerial policy, editorial prejudices and contribution variability, there will be changes in this and future Electric Flight columns, and we would all appreciate your feedback.

INTERNATIONAL RULE MAKERS

The CIAM committee of the FAI, the people who rule the roost in International aeromodelling, met again in April in Paris. With regard to the electric classes, discussion took place on two significant issues which should influence the development of contest electric flying in our country.

F3E

While the predominantly European experts agreed that the F3E Electric Glider (Soarer?) event (to become F5B) should remain unchanged, they can see that the power and expense of these models remain threatening to the vast majority of modellers who do not aspire to World Chams level. The contest format, however, is seen as a challenge to all, and a worthy event in itself even below World Champs level.

For many years Europeans have flown the F3E event at two levels, the second limited by a cell count of 10 sub C (1200 mAh) nicads. This resulted in smaller, cheaper models, and attracted good entry numbers. The Yanks have done something similar with 2 heavily promoted 7 cell F3E events. The powers that be can see merit in standardising and encompassing these second level events as an official international FAI class. They are favouring the 7 cell limit, for the obvious popularity and convenience in using this size battery pack. I feel we should support this move as it may well be the only way to rekindle interest in this great event in our country. We may then develop a background upon which to build enthusiasm for World Champs level competition for those so inclined.

Pylon

The second event under the scrutiny is F3E pylon (to become F5D). There is already a 7 cell limit in this event, which is not subject to any discussion. The change from 30 to 7 cells was made years ago, and the event has subsequently blossomed. This fact is probably influencing the discussion in the glider event. The present pylon rules are mirrored from the F3D, i.c. pylon class. That is, the course is 10 laps of a 400 metre course as fast as possible. This has resulted in some very fast little electric models. Times are approaching 100 seconds, compared to F3D approaching 60 seconds, but this has meant that motors are pulling up to 35 Amnps, aiming to use up all their 1200 mAh cells in less than 2 minutes.

It is also now difficult to set up a model without a race course because, although you might size a prop for a 2 minute run, you don't know until you try it whether it is fast enough to fly 4 km in that time. Consequently, every time we have run an electric pylon meeting we have had numerous models not make the distance due to flat batteries.

The new idea is more akin to the electric car races where the race is time based, not distance based. The proposal is to fly 4 minutes, plus extra time to finish the last lap. Scoring is then lap count, with extra time used to break ties. The principle is simple. It is then easy to set up a model to fly for the duration required, and when race day comes you know that you will finish.

The other major impact of the proposed change is to slow down the models and run motors and cells at more reasonable currents; i.e. 15 to 20 Amps. This means you can use a cheaper motor, but will necessarily need more effort in improving the efficiency of the whole motor, prop, switch, cells amd airframe combination. I would welcome your comments on these two proposals.

1992 WORLD CHAMPIONSHIPS

I advised earlier that Peter Pine had organised an offer for the MAAA to run the 1992 World Champs at Armidale. Unfortunately the CIAM decided that the Dutch offer would be more acceptable to the electric population based in Europe. I hope that the decision does not result in the demise of F3E flying in Australia.

THE NATIONALS

Bendigo this year should be a boomer, as a relatively central location to the Australian population should generate. The two electric glider (soarer) events are on the same day, which should work out OK if we put some effort into sharing the flying and charging time logically.



Nick Bowen with AP 29 powered McPlane made from styrofoam used (otherwise) for hamburger packaging. A careful look at this pic by Phil Stevenson will reveal many simple ideas of practical modelling. Phil says aircraft with foam are more environmentally friendly. I reckon the model is neutral: it is people who are, or are not, considerate of the environment.



New indoor RC model: span 1.5 metres, weight 350 grams, 5 x 450 Sanyo cells to drive geared Union-Sagami-Air Supply motor combination (UNSAGAS, perhaps?). Balsa structure covered with tissue. Phil is not going to launch it with his eyes closed! It's an indoor model and he is not indoors!

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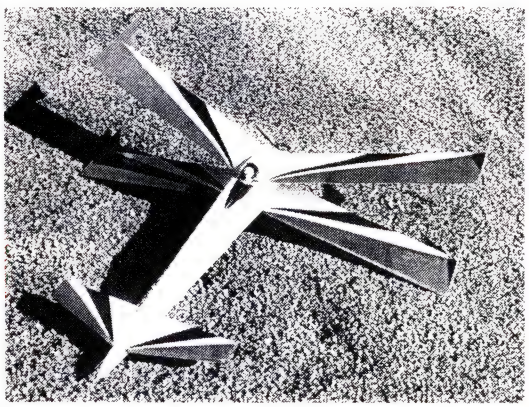
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NEW FUTURE FLIGHT X-WING

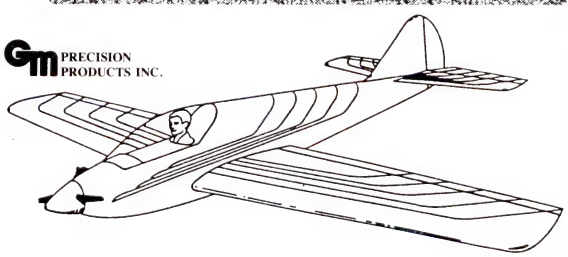
This futuristic X-Wing Canard is fun to fly and very different. Span 34", suit 049 to 28 Glow or 05 to 15 Cobalt Electric. Photo illustrated plans and instructions included. **ONLY $138.60 RRP**

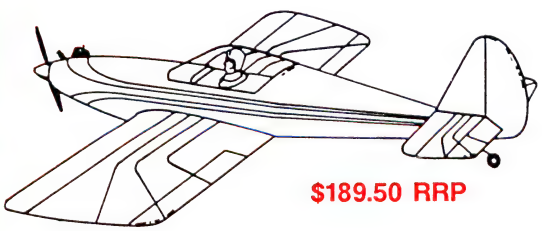
See Review this Issue

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DEALERS: CALL FOR ORDERING INFORMATION

After all, we squeezed in even more at the Wangaratta National Rally.

Seven Cell Glider has been a growth event since it was introduced, and this year should produce another record entry. Its the easiest event to fly, but at the same time very demanding to win. You don't need anything exotic to join in - any glider with seven or less cells able to stay up for 5 minutes. The top guns though are flying some nice little models which seem to be getting smaller, lighter and more powerful. The most popular model lately seems to be the Astro Mini Challenger at about 1.5 metres span. This is often powered by the FAI Cobalt 05, although it was designed for the 035. Because only a short flight is required, there has also been a trend to smaller cells. 900 SCRs were popular last year, but now the new 600 SCRs offer a saving of almost 100 gm, without power loss, but obviously a shorter run if you get a bad patch of sinking air.

F3E

Although there might be a few die-hards with full house World Champs level models, the opportunity is there for those flying 7-Cell on the same day to also enter F3E with 7-Cell models. The two task event, however, requires some different features. Even though the recent 5 minute duration task is the same as the seven cell event, the first 3 minute distance task demands much more. Firstly, the models for both tasks should climb quickly, but for distance they must also glide and turn quickly, which imposes much higher loads on the airframe. Over the years I've seen too many people break very good 5 minute 7-Cell duration models by flying distance at a speed in excess of the airframe capacity. Be warned: fly a stronger model. For the two tasks you will also need a longer motor run, so don't rely on 600s. You will need at least 900s or maybe 1200s for up to 2 minutes total motor run.

I hope I've been encouraging. See you there.

AEROMODELLING DIGEST 1990

The Editor has put together an independent publication consisting of many aeromodelling articles not previously published in this or any other modelling magazine. There are plans, drawings and construction articles on several electric models, including a couple of mine. Merv's own Whisper 7-Cell duration model is new to me, but looks excellent. There is a good mixture of other types of models, plus general articles on meteorology, materials, safety and so on. I've not got right through it yet - there is plenty to read. See the advertisment in this issue and send off your cheque or money order; it's well worth it.

INDOOR R.C.

Insanity has struck again, so if you read this in time to join us at Kellyville Soccer Federation Gym on 9th September from 2.00 to 5.00 p.m., come and join in. I'll report on the devastation next issue.

KIT REVIEW

Kit supplied by Speedline International, Gladesville, 2111

FUTURE FLIGHT X WING INTERCEPTOR

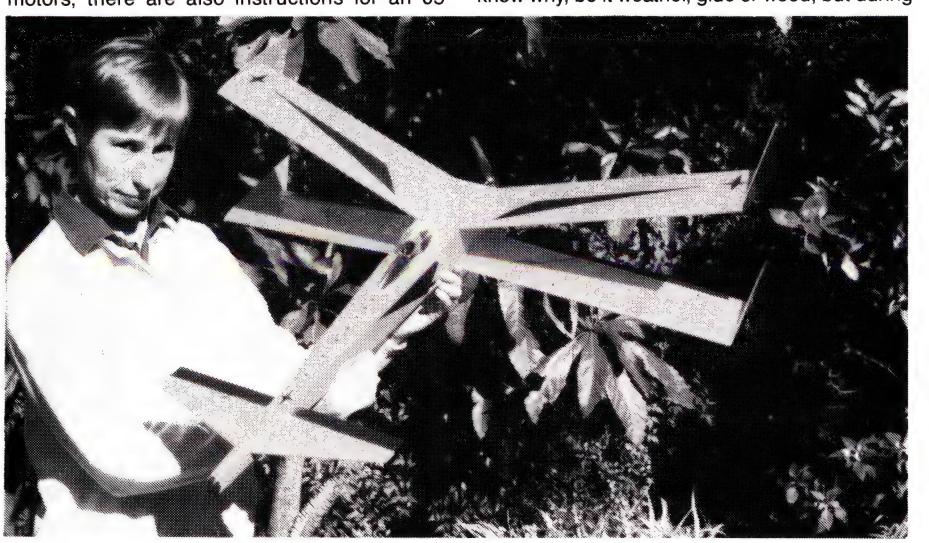
Future Flight is American, Richard Klingberg, whose most prominent model has been the Klingberg Wing. He is also a qualified glider pilot and designer of unusual aircraft, including his own full-size, Klingberg Wing slope soarer.

This excursion is obviously aimed at the, dare I say it, 'rat-bag' end of the market who are bored with models that look like aeroplanes or who just want to terrorise the cat. I'm sure the editor will love it!

It is best described as a pusher, bi-plane, canard. (So was the Wright brothers' Flyer, and, as I have built a P'Nut version of that, I guess I qualify for the X Wing too.) The X configuration comes from the upper wing's dihedral being reflected by the lower wing's anhedral. The lower wing has ailerons; the foreplane an elevator. There is no rudder; the wing tip plates act as vertical stabilisers. Designed for .049 to .10 i.c. motors, there are also instructions for an 05 electric version, and, of course, that is what I built.

The building instructions state several times that if you have difficulty building the model then you probably have insufficient experience to fly it. For a while I wondered if I qualified. The foreplane and fuselage went together without trouble, but the wings presented some difficulty. I think that the problem is that the LE sheeting provided is very hard wood, and when cut to the dimensions given does not fit adequately. I recommend that builders cut it at least 1.5 mm wider than instructed and ignore the instruction to glue it to the spar before the leading edge. You should then avoid the gaps that I obtained between the LE and the sheeting.

Most of the wood in the kit is appropriate for its intended use, although the LE sheeting was a bit hard, and some of the ribs a bit weak. I don't know why, be it weather, glue or wood, but during the wing construction I had difficulty getting the various CA glues to adher quickly. As most of the wood is too hard to pin, I spent some frustrating times with my fingers glued to the framework waiting for the wood-wood joints to cure.



Phil's wife, Larelle, with the X-Wing by Future Flight. Is she stunned or resigned? Who could take this seriously? Unusual layout disguises a good flying machine.



Appropriate pilot for weird X-Wing electric! Phil's shocking choice is a mutant crocodile! At least it's green!

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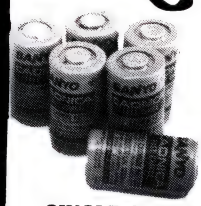
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Anyway, despite the frustrations I finished the model in about 20 hours, and took it flying. What normally occurs when a deadline is imminent is, of course, lousy weather, especially in July. Well, this time my luck had changed; perfect weather. The first launch by myself had insufficient urge and resulted in some minor damage. By the time I returned from repairs at home, half the club was there so I enlisted a javelin thrower for launch duty. Problem solved; smooth as silk. In fact, it flew just like a normal model once I got my visual perceptiions organised.

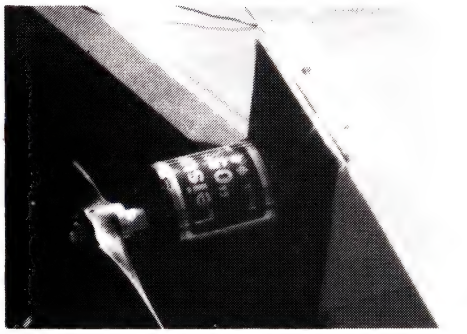
It rolls exceptionally well and loops reasonably proficiently. Flown at full throttle it uses up the power quickly, but it is, in fact, viceless. But when throttled off for landing the foreplane-elevator appears to be much less authoritative, meaning that slow flared landings are not on.

The test model has a modified Leisure 05, Taipan 7 x 6 and seven Sanyo 600 SCR cells. Radio is Aristo Hi-Tec 455 plus Aristo Hi-Tec BEC speed controller. All up weight is 1.2 kg, which is about the maximum for such a small (900 mm span) model, all be it a bi-plane, hence the fast launch velocity required.

After a few more flights I began to enjoy the model, and now plan to move the CG back from the foremost limit to get better elevator authority. More judicious use of the throttle should also lengthen flights, as would larger cells.

This model sure attracts attention. If you are into unusual aircraft then the X Wing Interceptor is for you.

PS



Power end of the X-Wing has Leisure 05 on Domino motor mount. Fuselage cross section could be reduced for streamlining. Stevenson photo.

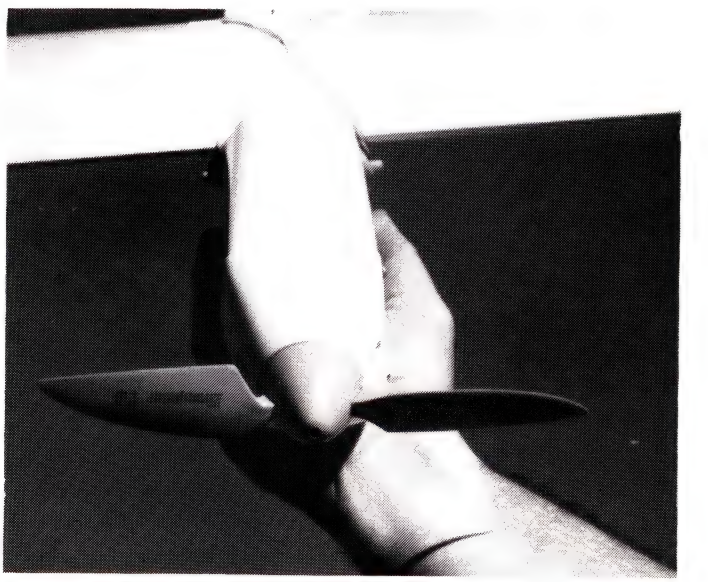
KIT REVIEW

THUNDER TIGER GULL 1900

SPECIFICATIONS

Wing Span:	**1892 mm**
Wing Area:	**39.5 sq dm**
Length:	**960 mm**
Weight:	**1200 gm**
Radio:	**3 channels**
Motor:	**540 PH**
Prop:	**8 x 4.5 folding**

Just as I finished building the X Wing, but had not flown it, I received the Gull ARF kit for assessment. Thinking that I had enough on my plate, I accepted, but made no promises of quick action. When I got it home I opened the box and began fiddling with the nicely built and presented components; and 3 hours later had it ready to fly.



Nose of the TT Gull, showing neat cowl moldings and stylish Graupner propeller and spinner. Review photos by the columnist.



Our columnist with the Gull. Nice size; and look at that decoration! Some secrets are revealed in the text. Further enquiries should be sent to Phil with an SASE.

This is one of the basic powered soarer-gliders. (I can use 'glider' here because I think they also do an unpowered version.) Everything is in the box except battery, radio gear and glue, and you need glue only to: 1) join the 3 wing sections together; 2) attach the tail feathers; and 3) fix the fuselage belly skid [if you need it].

The wings, fuselage and tail panels are all covered in white plastic film, with some lettering and decoration printed on. Additional decoration is available from an extra sheet of peel-back decals. All appear to be well constructed. The tail is sheet balsa, the fuselage is balsa with some ply, and the wing panels appear to be conventional balsa and spruce spars.

The motor supplied is a ball-raced Mabuchi 540 PH (metal back). The prop supplied is the superb Graupner 8 x 4.5 folder. The motor is mounted in a press metal bracket screwed to the ply fuselage structure. It is covered by a plastic cowl, and there is a similar plastic hatch between the motor and wing for battery access without removing the wing. All well thought out and produced, and easy to assemble.

Included for review, but not in the kit, was a **Thunder Tiger On/Off Power Switch.** This is rated at 20 Amps and includes battery eliminator and auto cut-off. The relay is wired to provide motor braking in the off position, a feature mandatory for folding props. It performed faultlessly throughout the test.

The kit is designed for 6 cell (7.2 V) power, so I charged a 6 pack of Sanyos and, having checked all systenms, took it flying. All up weight is 1.25 kg; pretty good. Beautiful, straight out; no trim changes needed. It climbs better than I expected for a relatively large (1.9 metre span) model on only 6 cells. I guess the good motor and prop help here. With power off it just floats; almost as slowly as a good 2 metre unpowered glider. It turns tightly if needed, and responds very well to control inputs. My only criticism is that the 1.9 metre wing does not fit in the boot of my car!

The model would well suit a beginner, who could soon get some extended thermal flights. The instructions include enough for a newcomer to properly prepare the model but sensibly then directs newcomers to seek assistance. It's good to see such a dominant producer as Thunder Tiger with a healthy attitude.

Kit supplied from Thunder Tiger Importer, **Radio Control Supplies, Penrith, 2750,** and available from good retailers.

P.S.



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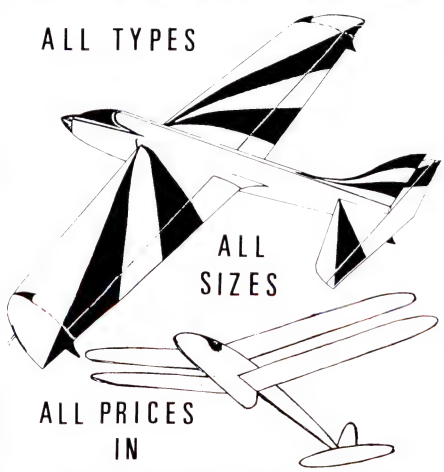
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For Old Timer Sake

by Colin Borthwick

While Colin is exercising his dual citizenship in the USA, the Editor puts a few spokes in the wheel of (Old Timer) fortune.

BEFORE HE WENT

The Vintagents conducted a fun fly for Duration and Texaco (big and little) at Amberley on 3 June, and our columnist won the lot! Yes: all three events. The weather was gorgeous, says reporter, John French, and thermals were generously shared by all and sundry.

Gordon Burford had his compressed air model rescued from a prohibited-entry part of the air base over a kilometre from launch; and a ½A Banshee tried to take off beackwards when the prop reversed rotation on hitting an obstacle! Who can doubt that these OT get-togethers provide a lot of fun?

There was a fly-off in Duration between Borthwick and Dave Paton, and the Saito 65 in the 4 lb Bunch Scorpion topped Dave's model. Big Texaco was won with a full score of 1860, and Little Texaco with just 1730 points.

J.F. says these events have just the right mixture of low pressure camaraderie, contest nerves and satisfaction with each max. However, John's Cloud Cruiser with OS 40 4-stroke had a case of nerves, and would give only 20 second engine runs. In Texaco?

As a reward for his efforts, Colin was given permission to leave the country, if only for a short while.



Leo O'Reilly and the Thunderking, still winning after something like 30 years. Was featured in early editions of Airborne. Often the simplest things in life are the best! Good pic by John F.

THE ITALIAN JOB

Mentioned last issue was a booklet of Italian vintage power models, collected and published by Ferdi Gale, and available from him at:
Via Marconi 10, 28042 Baveno, No, Italy. Cost is 25,000 lire. The text is in Italian, but the 3-views occupy almost a foolscap sized page each, so are large enough for scaling up. The collection starts with the BM1 of 1941, and goes through 20 designs, including a couple of sea planes, to Il Bucanuvale of 1946. All are very interesting. Most are quaint. The famous Moar 1942 is included. Some are very advanced for their era. The material is mostly photocopied, but the quality is adequate to enable designs to be built from the data provided. Any Old Timer will be grateful to Ferdi for this collection.



Another Norm Bell AIRBORNE Question Time photo. Who is the modeller with the very nice Blackburn Monoplane? Taken in the late '50s at Boundary Road, Brooklyn, Victoria. Guesses to the Editor, please.



Harold Stevenson and his nice, clean Nimbus. Also shown on the cover of Aeromodelling Digest 1990. This pic by John French.

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LIFE IS CHANGE

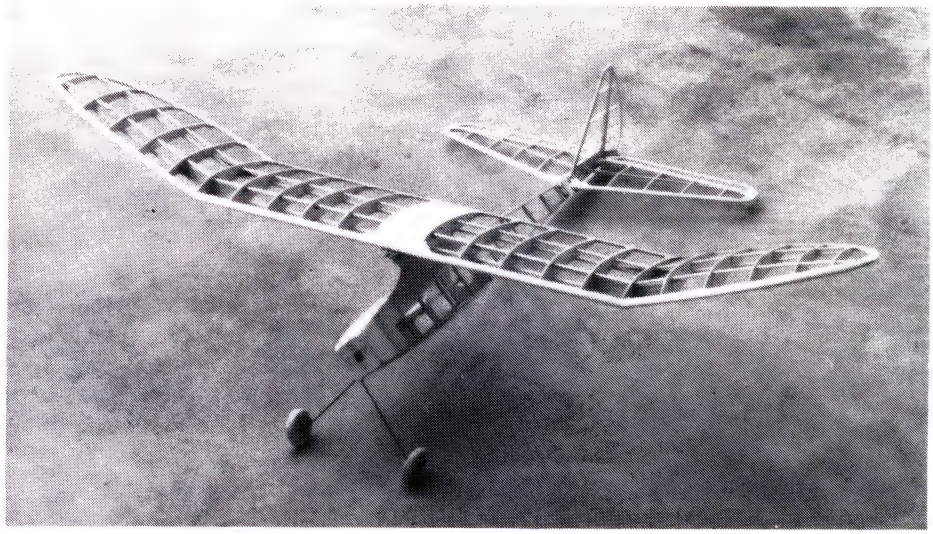
When building a replica of a model designed by another modeller, it is not possible to duplicate exactly every item of the original. It is not even possible to show every detail on the plan that is used to build the replica. This has been recognised by the Old Timer groups around the world, with a clear lead given by the plug sparks of the OT movement. For contest purposes there should be no changes to the size, shape and nature of the structure when producing a replica model. This results in some gawky undercarts and not-so-effective controls when RC is added, but the basic idea has been well supported by the flyers in general.

However, changes are needed to provide for radio control, and this has caused some contention in the past. For the best RC set-up it helps to shift the undercart, to reduce the dihedral and to use biconvex aerofoils on the tail surfaces, particularly the rudder. Cut-outs in the elevator for rudder movement also help to enable the proper location of fin and rudder to be retained. All these changes are regarded as unacceptable to contest flyers; each has to learn to cope with the effects of these features which were developed for free flight action.

The situation is not as clear-cut when scaling a plan down for ½A contest flying. As an example, consider the **ANDERSON PYLON** which is reduced to 50% of the size of the original.

1. Fuselage. The framework consists of 4 longerons with cross pieces. This can be copied exactly, with provision for wing and tailplane mounts as on the original, although, with the wood sizes reduced from 3/8 to 1/8 square, spruce, not balsa, should be used for the longerons. The engine and undercarriage mounting is also easy to copy; even easier in the ½A version because the Cox engine clamps the single wire u.c. to the plywood engine mount former with the standard radial mounting.

More cross pieces could be added to prevent the longerons from bowing when the fuselage covering shrinks, and some sheeting around the nose strengthens this area greatly. I mounted the u.c. on a brass tube epoxied behind the ply firewall: it is removeable for transport.

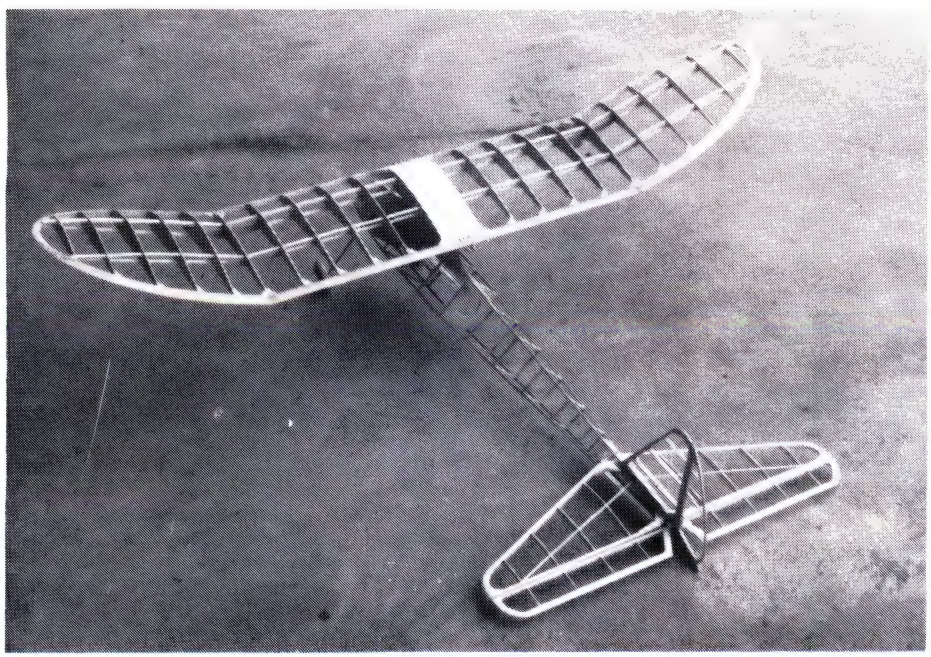


The ½A Anderson Pylon. Framework by the Editor to the John Pond plan. Changes and modifications are discussed in the column. Fuselage longerons are spruce, but bowing has developed in spite of the precautions discussed in the text.

2. Wing. Alva Anderson designed a wing with split ribs and full depth spars between them. The John Pond ½A plan has normal full ribs and two under-and-over spars that can be turned into I beams. The original was complex; the half size version is simpler, and has better engineering. I recessed the top spars so that the split rib with cap strip style of the original was retained. On the ½A model the wing sheeting at the dihedral breaks is omitted, as the number of ribs has been reduced. No changes to the Pond plan are needed for the wing. I used spruce TE and put in TE gussets to ensure stable joints with the ribs.

3. Tail. The fin on the original was ¼ inch thick. Half of that is too thin, even for the small version. I cribbed a millimetre when using some scrap wood, but even so the fin and rudder need some diagonal bracing to reduce the chance of warps.

The tailplane is also very thin. The ½A plan has full ribs instead of split ribs, the front spar is angled instead of being parallel to the elevator spar, the tips are reduced from wide sheets to outlines, and the elevator has a cut-out for the rudder. I approve of all the changes because they make a much nicer tailplane. It would be feasible to copy the original, although the elevator spar would be inadequate and it may be too heavy.



Half-sized Anderson Pylon has simple but delicate structure. Careful building is required. The model is a superb flyer, being designed originally for free flight. Diagonal bracing in tail plane, fin and rudder are recommended.



Basil Healy with Veron Combateer. Fine flyer, photographed by J. French. Is that an AMCO 35? Basil has a vintage FF design published in the Aeromodelling Digest.



Montgomery Model Bambino is dwarfed by John Quigley and his pit crew. No 4-stroke in this one!



How to produce your own Old Timer. This 175% Tomboy by Bryan Carwardine has Saito 30 powerplant. Moderate wing loading enabled it to cope with the temporary breeze at the Veterans' Gathering at Muswellbrook. Weather was mostly sunny and calm. Really grouse! That's Steve Vickers in the checked shirt.

The model has a short nose.

Covering

This is a matter of choice, since most types (including iron-on film) were available in the era of the Anderson Pylon. I chose silk for the wing; black underneath and white on top. The fuselage I covered with lightweight Microlon, then I covered both fuselage and tail with white tissue. After a couple of coats of thin dope to get a moderate tightening of the covering, I laced the dope liberally with Tricresyl phosphate platiciser (use castor oil instead of TCP) and put on three more coats of dope to get a good seal and finish. Then I gave the fuselage and tail a complete, light coat of Estapol gloss to fuel-proof it all (give the nose and pylon LE a second coat) and to retain the only-just-taut-enough covering tension. This technique was necessary to prevent further shrinkage of the covering and warping of the structure. I used CL wire for rudder and elevator controls.

Since the model has to weigh just over 16 oz. for contest flying (8 oz per sq ft), the use of mini servos for rudder and elevator, a small receiver and a 250 mAh battery leaves about a 1 ounce margin underweight. This can be gained with some diagonal bracing in the tail structure and some extra gussets. Balsa wheels are quite adequate for ROG.

Flying.

I found that the model balanced at 36% of the root wing chord, and that this required the wing incidence to be reduced by 2°. After all, this is not a free flight model any longer. The elevator trim was then level with the tailplane, and a few clicks of up trim improved the climb rate when circling in a thermal. With this arrangement the model flys impeccably. When there is no drift the model can be left hands off the sticks for 5 minutes or more as it slowly circles up under power, and even more slowly circles down on the glide.

Re-appraisal

This Pond plan (available from Airborne), is an excellent ½A Old Timer. It is half the size of the original. It is not strictly a replica because the wing and tail structures have been simplified. The outlines and sections are correct though, and it can't be anything else but an Anderson Pylon. Whether you accept the changes or not is up to you. Let's be grateful that we have such a great design from 1937, and enjoy flying copies of it.

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ON SILENT WINGS

by Bruce Abell

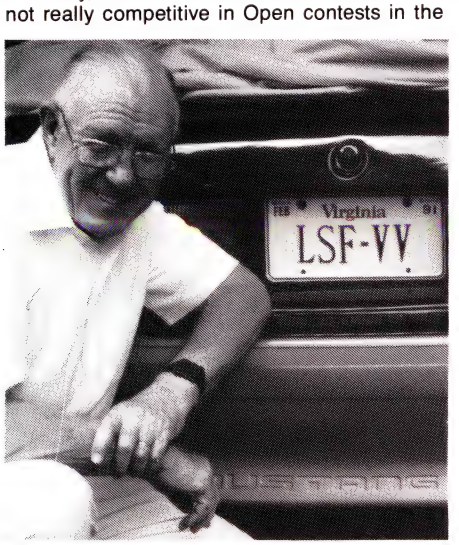


With only one winch going, you wait your turn! Contest at Modesto, California, under way. Bruce Abell with the camera. Modified Windsong in the foreground. Silent flight enables use of school grounds surrounded by houses.

OVER(SEAS)-VIEW

Just over a week ago (as I write this) I arrived back in Oz after almost 3 months touring the U.S. of America, where I had the privilege (and honour) of spending a lot of time with some of the most hospitable people it has ever been my good fortune to meet. I found the Americans, as a whole, to be very warm, friendly people, and I thank those who took my wife and me into their homes and then went out of their way to entertain us and show us their great country.

I managed to fly in two Old Timer competitions (flying Ed Hamler's and Don Bekins' models), and three glider events but, sad to relate, the OT events were the only ones in which I managed to take out any trophies. I did build two of my 2 metre Scimitar gliders and sent them ahead. Jim Gray and Herc Stokely assembled them for me to fly, but I found that 2 metre models are not really competitive in Open contests in the USA due to their system of running competitions and their method of launching, so a description of both these is of interest.



Bob Champine, as if you didn't know!

In all 3 of the glider conpetitions in which I flew there was only one winch in use. This meant that neither a man-on-man nor a group scoring system could be used and, as we in Oz know, this is grossly unfair if some pilots are forced to launch in bad air while others get the good air!

Why do they organise this way? Basically it seems that the majority of flyers are not prepared to walk 200 metres down to the turn-around to bring back the line after each flight, and don't seem to be prepared to build or buy their own winch! Several top flyers that I discussed this with agreed that this was unsatisfactory and they would like to see it changed but had not been able to remedy the problem. To overcome the retrieval problem the club winches used have a power retrieval system operated by the Winch Master, who calls up each competitor, launches him and then retrieves the line. Further to this, they are still using braided line instead of monofilament!! Combine this with the return line and you have a very high drag and heavy launching system that severely penalises the small glider. Also, they didn't use the positive lock-up system of the push-bike sprocket but rather a braking system that still allowed a large model to play out line when kiting in a strong breeze; still further penalising the small model.

I did fly under these winching conditions in a 2 metre competition and was still unable to compete successfully, although I wasn't quite last in the field. To get a steep launch without the line being dragged off the towhook using this system would need some experimenting with the towhook position and shape, maybe even using a captive hook. This would be allowable under US rules, which put no limit on the number of functions used on a 2 metre model.

Another side effect of the braided line is the inability to pre-tension the model prior to launch, as the braided line has no stretch and the pretension is gone as soon as the model is released, whereas the monofilament acts like a bungee when releasing the energy stored in it by pretension. The monofilament also gives a much better zoom because of the stored energy in the monofilament line.

The publication of the Selig-Donovan-Fraser low speed wind tunnel experiments and the related development of special wing sections in Soartech 8 has had a fairly dramatic effect on RC glider design in America, with the almost exclusive use of these new sections in all the new glider designs, predominant among which is the Falcon 880 with the S3014 and S3021 sections, 112 inch span and 10 oz/sq ft wing loading. I have seen this design fly and it is a good performer, but I feel that the Windsong and Lovesong with a turbulated Eppler 214 section will outperform it in conditions other than those requiring good high speed performance. I saw Dave Banks (Seattle) consistently thermal a Windsong from a hand launch!! I'm certain that the Falcon 880 would have much more difficulty in this area of performance.

This all makes me wonder whether a lot of current RC glider designers are being misdirected by modern computer design technology and the modern high performance aerofoils which are designed for performance at Reynolds numbers of 150,000 to 200,000. I worked out the Reynolds number for my Airborne 88er, which flys at 10 oz/sq ft, has a span of 120 inches and an aspect ratio of 15:1, and found it to be 110,000. Now, this is an area where the Selig-Donovan-Fraser tests show clearly that turbulation of some

aerofoils (particularly the Epler 214) is very beneficial and that some of the older ones (such as the Clark Y) perform very well indeed, so perhaps it would be best to ascertain first at what Rn the wing of a proposed model is likely to be flying before locking in on a particular section. For the benefit of those readers who missed it in a previous issue of Airborne, I will set out the necessary formula for determiniung Rn again:

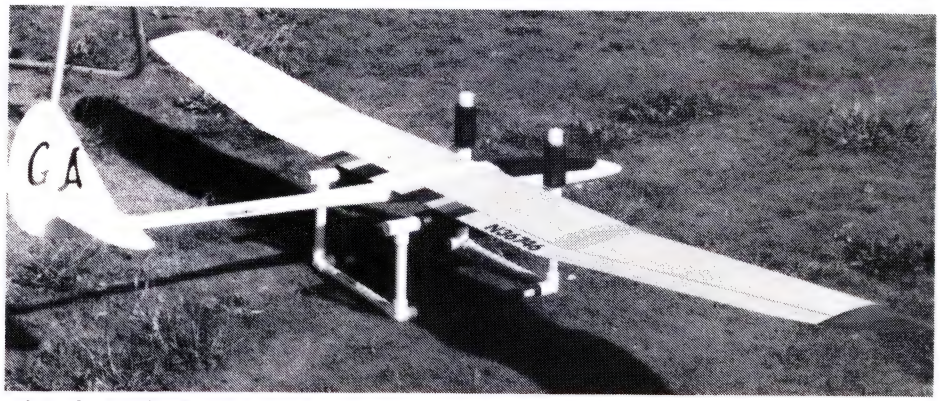
(1) Divide the model weight (in lb.) by the wing chord (in sq ft.).
(2) Multiply (1) by 1000.
(3) Take the square root of (2) to get the speed in ft per sec.
(4) Multiply (3) by the average chord in ft.
(5) Multiply (4) by 6300.

I would suggest that all serious glider guiders copy this out and pin it up in a prominent place on the wall of their workshop, as I have done, as they will find it to be an invaluable tool.

While in the Seattle area, Bill Kuhlman took me to meet Bob Dodgson. I found Bob to be, as expected, a most interesting person to talk to. I spent a couple of hours discussing all aspects of RC model glider design and performance.

Bob's Windsong and Lovesong fuselages are an interesting design, as they are one-piece moldings a la Taco shell, with the top built up from balsa. However, he has found that most American modellers today are not prepared to spend the time needed to build this type of fuselage and prefer to build (?) models that have the fuselage virtually completed for them, and are prepared to pay for this privilege. As a result, Bob is now developing a new design that has a completed fuselage and, as a further concession to current fads, has departed from his past practice of using the Eppler 214 to use a Selig section. He was to test fly the new bird the weekend after I left, so I can't give an indication of its performance.

Another interesting man I was privileged to meet was Bob Champine, the only person in the world with **two** LSF level 5s to his credit! Bob is retired now, but worked as a test pilot for NASA, and test flew things like the Moon Lander prototype, the Regalo Wings, the tilt-wing VTOL aircraft and the Bell X5. He also has a couple of boxes full of old model aircraft props. Some are whole, while others are broken, and almost all of them have written on them the model and engine they are from and the date they were flown. There is some great history of model aviation in those boxes alone! One of these days I hope to talk him and his friend (and mine), Herc Stokely, to visit us here in Oz.



Jerry Arana's OD Chameleon at Modesto, California. Wing is 810 sq in, uses Selig 3021, stab is 8% of wing area and weight is 76 oz. Has elevator, rudder, ailerons and flaps. Abell photo.

Our American friends seem to have had bigger problems than we have in finding suitable flying fields. Most of their flying seems to be done on school playing fields, and clubs are continually on the look-out for flying fields. Often they travel up to 100 kilomentres to get to a suitable flying field, and in Virginia Beach (Virginia) we even travelled 150 km to get to a **club** flying day! Obviously, with their high density population, this is going to be a worsening problem, and perhaps we in Australia should be looking ahead and purchasing flying sites for the future.

Dan Bekings, of SAM 27, is trying to set up a tax-free organisation to purchase a parcel of land at Lost Hills in southern California to replace the famous Taft site, which they are likely to lose. This seems to be the way we should go, so perhaps someone knowledgeable in this area could write in to advise us all of the practicalities and pitfalls of such a move in this country, otherwise we will eventually end up like our American cousins.

Another really fascinating experience I had was seeing the second outing of Bill Kuhling's F3B style flying wing. This aeroplane is **fast!** The glide is very, very flat, and slowing it down for a landing is a problem. The flaps work fairly well in this respect, but the nose-high attitude with flaps down caused a sudden stall when transitioning to normal, un-flapped flight, due to the considerable change in airspeed. Launching also posed a problem, as the model needed a high speed launch and the aforementioned use of braided winch line made this a bit tricky. However, the model showed great potential, and I'm sure that Bill will sort it all out in the near future, as he has already had a third flying session that was more successful. Incidentally, Bill will be reporting his progress with this design in RC Soaring Digest in future issues.

I believe also that our own Garry Jordan in Brisbane is developing an F3B flying wing design, so I hope to be able to report on that one in future issues.

I read with regret the final of Martin Simons' articles in Airborne No. 100. I have thoroughly enjoyed all of Martin's articles over the years, and I hereby say "Thanks, Martin" on behalf of aeromodellers everywhere for a most informative and stimulating series.

CORRESPONDENCE

From Ron Barnes of Watson, ACT, I received



Bill Kuhlman readying his OD F3B flying wing for a test flight. Flapervators and flailerons? Mixing of controls at the Tx would make this approach competitive.



New Darwin flyer is Scott Lawford with his Orange Box derivative, built during the previous weekend. Top End modellers gave the Editor and his family wonderful hospitality on a recent visit.

a letter with 3 queries that should be of general interest. They are:

"1. Do you know where I could obtain a plan of the Schweitzer shown with Phil Grandon in Airborne No. 99?

2. Could it be launched with a 3/8 inch bungee? Or would it require a winch?

3. Why is the tensioning wheel on your winch cross spoked in that special manner?"

In my reply to Ron I made the following comments:

1. A letter (with SASE) to Frank Smith at 1/57 High Street Road, Ashwood, Vic., 3147, will probably get you the information about the Schweitzer.

2. The model is fairly large, so I don't think that a bungee would be practical. I would suggest winch launching first in order to ascertain the line tension required.

3. With regard to the cross spoking on the tension drum on my winch, the spokes are set at an angle so that it helps centre the line due to the radiussed effect. It is difficult to draw, but putting one together shows what I mean.

I would like to hear about your projects, or questions, but please include a stamped, self-addressed envelope if you ask for an answer. Send your news and views to **Bruce Abell, 17 Ferguson Street, Cessnock, NSW, 2325.**

BOOK REVIEW

While in America I was given a new book written by Dave Thornburg titled **Old Buzzard's Soaring Book.** I found it to be one of the best books I have read on soaring. The book consists of thirteen essays that are written in a light-hearted manner but contain excellent advice for the glider pilot who has attained a moderate level of proficiency but wants to improve his flying and win a few competitions.

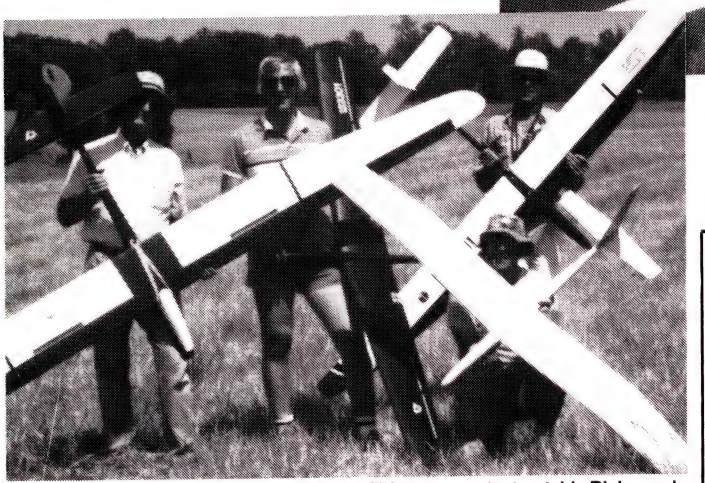
Dave has been writing articles on RC soaring since 1967, and is well known as a competition flyer and designer, so his writing is based on years of practical experience. This is evident in the way his explanations avoid pure threory that all too often only succeeds in confusing the reader, and gets to the meat of the matter in a very easily understood way.

The Old Buzzards Soaring Book is available from The Pony X Press, 5 Monticello Drive, Albuquerque, New Mexico, 87123, USA. The price is US$16.45. That probably includes surface mail in the US, so $20 should cover air mail across the Pacific.

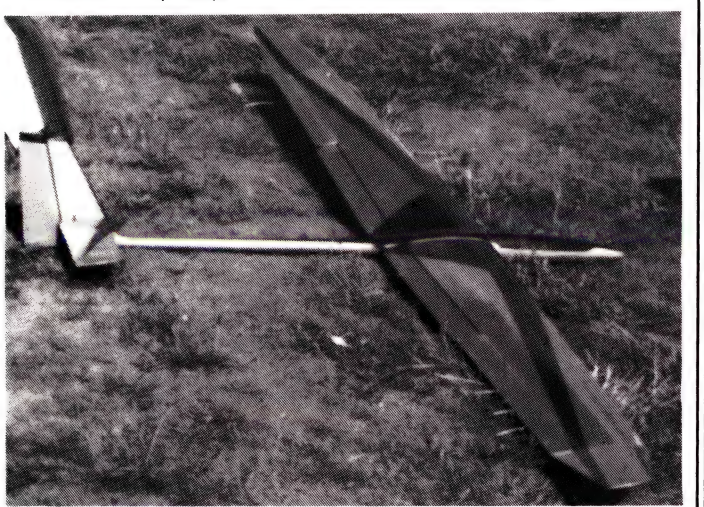
B.A.



Carel Berendes with his DG 100 before a short maiden flight. He missed the touch-down spot and clipped a tree over the crest of the hill. The model has been re-built, flys well, but is difficult to launch solo. Sanwa 7 channel radio controls rudder, elevator, ailerons, airbrakes and retracting wheel with a separate battery.



An international gathering of pilots at the Tidewater contest outside Richmond in Virginia in May. L to R: Herc Stokely (US of A) with his Turkey; Colin Britcher (UK) with his Algebra; Bob Both (Sth. Africa) with his OD bird; and the OSW columnist (of Oz) with his Scimitar.



A Falcon 880 as mentioned in the column. The photo was taken at Modesto in California by Bruce on his USA journey in July.

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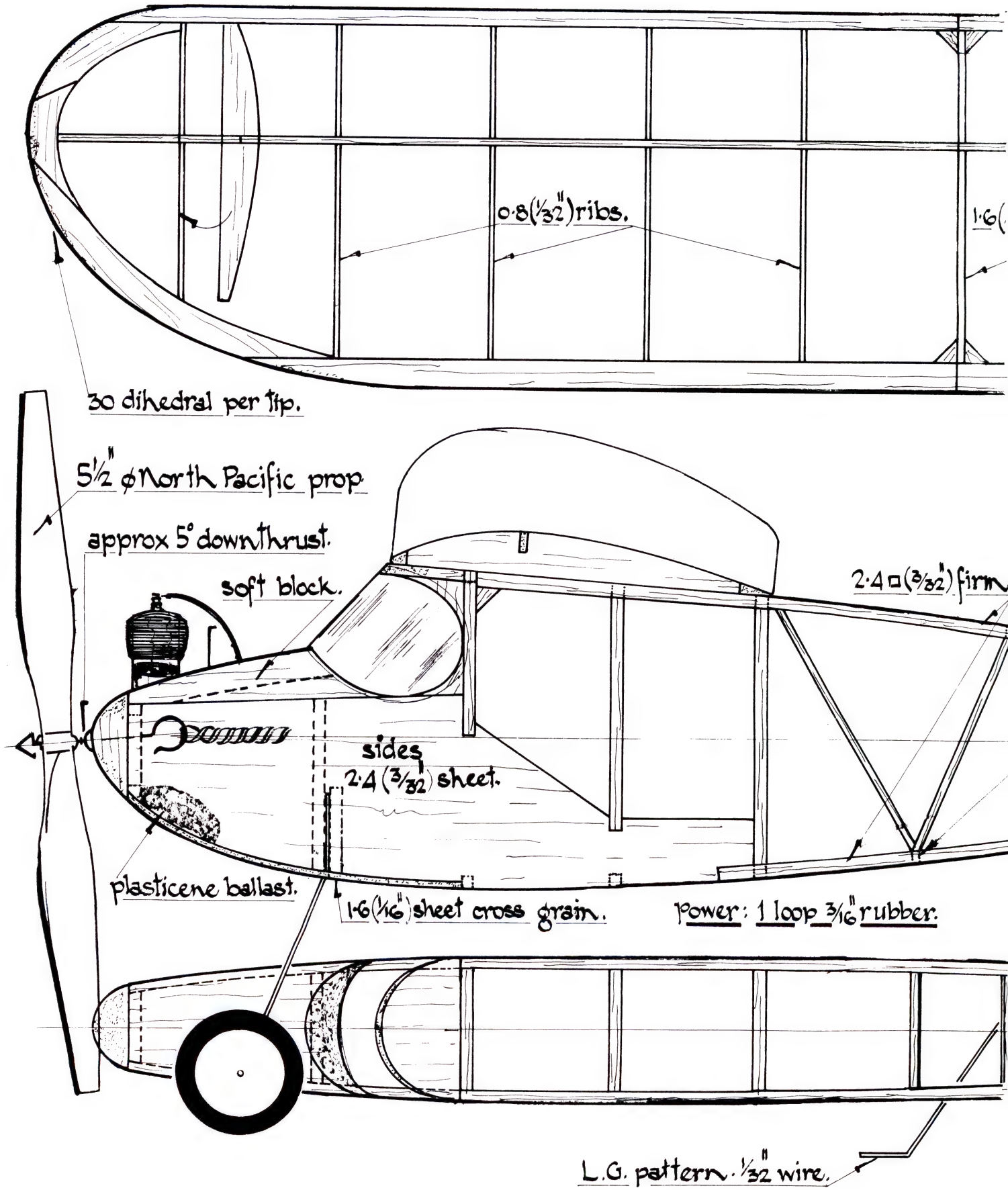
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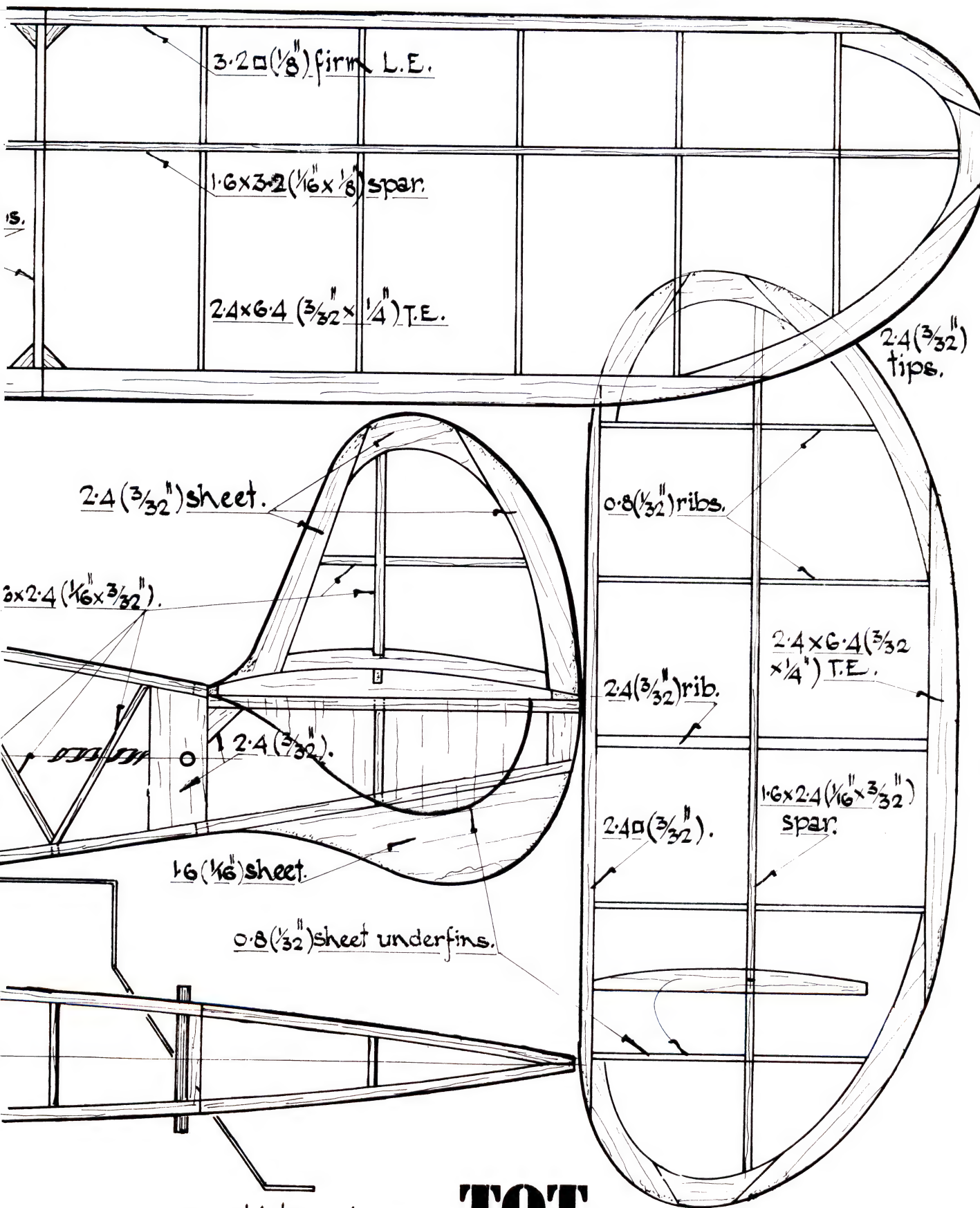
1.2 mm (3 ply)	2.0 mm (5 ply)
1.6 mm (3 ply)	2.5 mm (3 ply)

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0·8(1/32")ribs.
1·6(
30 dihedral per tip.
5½" ϕ North Pacific prop
approx 5° downthrust.
soft block.
2·4 □(3/32") firm
sides
2·4 (3/32") sheet.
plasticene ballast.
1·6(1/16") sheet cross grain.
power: 1 loop 3/16" rubber.
L.G. pattern. 1/32" wire.



an old-timer look-alike **TOT**

GUMNUTS

FUN FLYING WITH SMALL MODELS



by Jaime Herder and Ron Neve

The Golden Era of modelling lives on and on, with oldies "shrunk" down to .020 and CO_2 size to fit into equally shrunk flying spaces (and budgets!) - quite beside the fact that vintage motors belong to a minority, and are available usually on a trading basis only. The TOT (Tiny Old Timer) was designed to embody all the classic beauty of those Megow, Comet, Scientific and so on, models, without over-resembling any particular one, and to use rubber propulsion. The dummy motor is optional, but does wonders for realism. (My TOT is to have an Ohlsson installed.) Although some wood sections are generous, the TOT, even with nose ballast, builds lightly. It just happens to be a wonderful flyer too.

Construction is straightforward, but put pride into this one - you will be glad you did.

The **wing** is built right on the gladwrap-covered plan, with the tough leading edge and pre-sectioned trailing edge pinned down first, tip components added next, then the ribs. Only after the wing is dry, fully sanded and satisfactory is the centre section parted and outboard panels bevelled and glued to the dihedral shown. Now fit the gussets and recheck the dihedral. If correct, add the spar to the centre section, then the remaining panels, pinning down each as it is involved. Sand off high spots and glue gobs.

The **tailplane** is also a right-on-the-plan job, so needs no special instructions beyond KEEP IT LIGHT. TOT has a short nose, so any tail end weight is exaggeratedly felt. Sand the fin to marginally over 1/16 inch thick, and do good leading and trailing edges to reduce wood bulk; this also applies to the stab.

The **fuselage** is beefy, but a 3/16 inch rubber motor (or CO_2) dictates this. A steep climb is part of the character. Build one side, then the next directly on top (with gladwrap between to prevent adhesion). Lightly sand both faces of each side and tack glue the bevelled tail ends together, adding cross-members from the cabin back, then pull the nose together with a rubber band, and add the respective cross members. Next install the landing gear, and sheet in the underside as shown. Before decking the nose, make a rough, oversize nose-block and ensure that it plugs snugly into the nose aperture. Now add the nose deck block, face off the front, and plug in the nose block. Sand the assembly to the correct contours, then add the cabin top semi-circle and window frames. Lightly sand the fuselage, and inspect for symmetry. Drill the nose block and fit a plastic nose plug with eyeballed downthrust. Guesstimate the amount of nose ballast needed, and mold it into place.

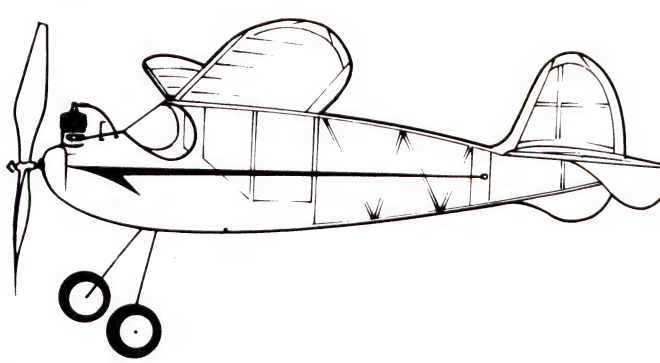
I always apply two light coats of dope to the entire framework, then touch up with No. 1000 wet and dry. It does marvels, and the weight penalty is negligible.

Now **cover** the model with the lightest tissue available, water shrink with fine atomised spray, and when dry, brush on two scant coats of much thinned nitrate clear dope. Sand off any tags etc with No. 1000 paper, and assemble the TOT. Install the shampoo-lubricated rubber, and balance under the wingtips at the spar, adding or reducing plasticene nose ballast as required.

Test glide, and make fine adjustments with ballast until it is satisfactory. Hand wind in some turns, and launch gently. TOT should fly stably away. Gradually increase power with each successive flight. The trimmed TOT has a sweeping climb; it is nostalgia on the wing, and looks like a real Old Timer very high up (an optical illusion because of TOT's small size).

Gotta go! Must install that dummy Ohlsson! Hope you enjoy TOT as much as I do.

TOT



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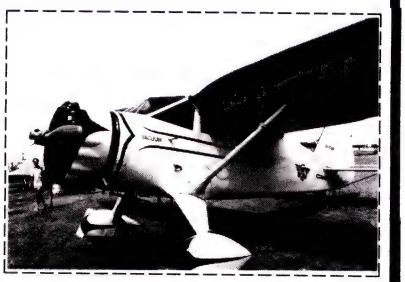
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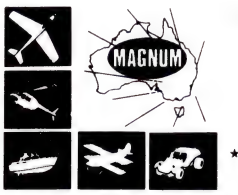
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SOLARFILM

*** NEW COLOURS ***
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Fluorescent Red
Violet
Heather
Clear

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COVERING MATERIALS

FIBAFILM

(to be used with BALSALOC)

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A SUPERB PAINT FOR MODELS

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Flight Analysis

by Martin Simons

List of Articles

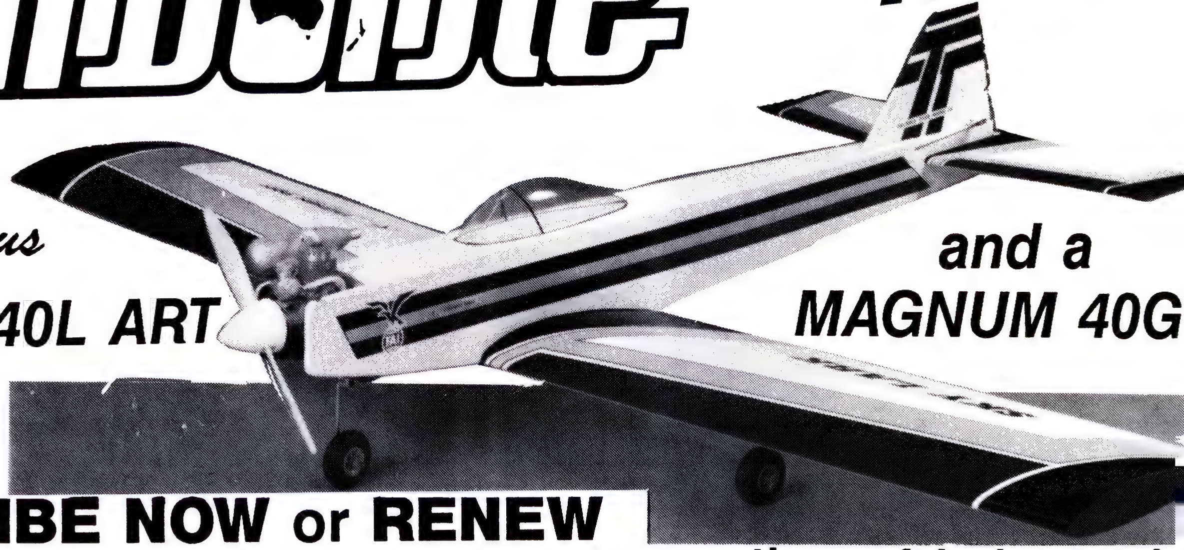
1. Angles of attack	Airborne No. 45	June 1981	page 63
2. Profile drag	Airborne No. 46	Aug - Sept 1981	page 65
3. Camber	Airborne No. 46	Aug - Sept 1981	page 66
4. Ideal angle of attack	Airborne No. 47	Oct - Nov 1981	page 74
5. More about aerofoils	Airborne No. 49	Feb - March 1982	page 60
6. Cambered profiles	Airborne No. 50	April - May 1982	page 70
7. Flow separation and the boundary layer	Airborne No. 51	June - July 1982	page 64
8. Aerofoil selection and boundary layer control	Airborne No. 52	Aug - Sept 1982	page 83
9. Vortex induced effects	Airborne No. 53	Sept - Oct 1982	page 83
10. More about vortex induced drag	Airborne No. 54	Nov - Dec 1982	page 103
11. Aspect ratio and planform	Airborne No. 55	Jan - Feb 1983	page 94
Aspect ratio and planform	Airborne No. 56	March - April 1983	page 71
12. Aspect ratio, angle of attack and airflow	Airborne No. 58	July - Aug 1983	page 80
13. Balance and stability	Airborne No. 59	Sept - Oct 1983	page 80
Balance and stability	Airborne No. 60	Nov - Dec 1983	page 80
14. More about the aerodynamic centre	Airborne No. 61	Jan - Feb .1984	page 72
15. Longitudinal stability	Airborne No. 62	March - April 1984	page 72
16. Longitudinal stability	Airborne No. 63	May - June 1984	page 80
17. Longitudinal stability and effects of power	Airborne No. 64	July - Aug 1984	page 56
18. Longitudinal stability and Unorthodox layouts	Airborne No. 65	Sept - Oct 1984	page 66
19. Dynamic instability in pitch	Airborne No. 67	Jan - Feb 1985	page 84
Dynamic instability in pitch	Airborne No. 68	March - April 1985	page 82
20. Lateral stability and control	Airborne No. 69	May - June 1985	page 86
21. Lateral stability and control	Airborne No. 70	July - Aug 1985	page 64
Lateral stability and control	Airborne No. 71	Sept - Oct 1985	page 83
22. Spiral stability	Airborne No. 72	Nov - Dec 1985	page 96
Spiral stability	Airborne No. 73	Jan - Feb 1986	page 68
23. Keeping things under control	Airborne No. 74	March - April 1986	page 68
24. Control functions and effects	Airborne No. 75	May - June 1986	page 68
25. Stability and control: flaps	Airborne No. 76	July - Aug 1986	page 71
Stability and control: flaps	Airborne No. 77	Sept - Oct 1986	page 66
26. Stability and control: flaps and slats	Airborne No. 78	Nov - Dec 1986	page 82
27. Propellers	Airborne No. 79	Jan - Feb 1987	page 66
Propellers	Airborne No. 80	March - April 1987	page 64
28. Momentum theory and propellers	Airborne No. 81	May - June 1987	page 88
29. Vortex theory of propellers	Airborne No. 82	July - Aug 1987	page 52
Vortex theory of propellers	Airborne No. 83	Sept - Oct 1987	page 76
30. Helicopters and gyrocopters	Airborne No. 84	Nov - Dec 1987	page 90
Helicopters and gyrocopters	Airborne No. 85	Jan - Feb 1988	page 74
31. Novelties, Oddities and Strange Contraptions	Airborne No. 86	March - April 1988	page 78
Novelties, Oddities and Strange Contraptions	Airborne No. 87	May - June 1988	page 74
32. The birds and the bees	Airborne No. 88	July - Aug 1988	page 72
33. The birds and the bees	Airborne No. 89	Sept - Oct 1988	page 84
34. The birds and the bees	Airborne No. 90	Nov - Dec 1988	page 79
35. The birds and the bees	Airborne No. 91	Jan - Feb 1989	page 84
36. The flapping flight of birds	Airborne No. 92	March - April 1989	page 58
37. Wind and weather	Airborne No. 93	May - June 1989	page 88
38. The effects of wind on flight	Airborne No. 94	July - Aug 1989	page 74
39. Wind and weather	Airborne No. 95	Sept - Oct 1989	page 74
40. Wind and weather	Airborne No. 96	Nov - Dec 1989	page 94
Wind and weather	Airborne No. 97	Jan - Feb 1990	page 66
41. Wind and weather: thermals	Airborne No. 98	March - April 1990	page 57
Wind and weather	Airborne No. 99	May - June 1990	page 55
The End	Airborne No. 100	July - August 1990	page 50

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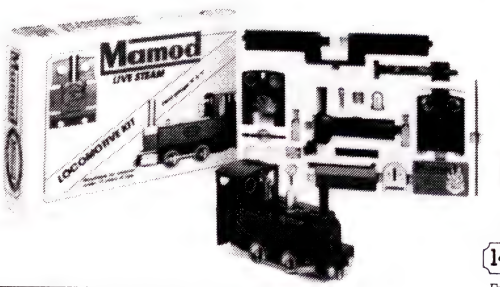


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This kit enables the user to build a unique and realistic working model which captures the realism of years gone by.
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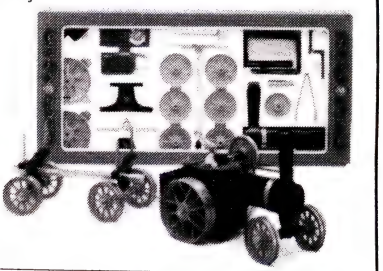
Steam Roadster Kit SA1K

This kit enables the user to build a magnificent working model of a motor car which captures the elegance of the Edwardian era.
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1402 Steam Locomotive Kit SLK1

A classic example of an early 040 Welsh side tank engine. An excellent introduction to the garden railway. This kit enables the user to build to either 'O' or gauge '1'. Its twin double acting arrangement provides a powerful unit. Also suitable for LGB.
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1400 Tractor and Wagon Kit TWK1

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Pack: 600 × 290 × 80mm. Gr. Wt. 2500g. **$140**

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This kit enables the user to build a fine example of an early Edwardian fire truck. Finished in typical bright red with brass and chrome trim.
Pack: 585 × 540 × 100mm. Gr. Wt. 3450g. **$230**

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FANTAILS

by Russell Weir

WHAT WOULD YOU LIKE?

The most convenient way of venturing into model jets is to select a glass fibre kit of the desired type of aircraft. In this country kit availability is limited to the choice of A4 Skyhawk, F20 Tiger Shark, F18 Hornet, F16, F86 Sabre, MIG 15 and Sport Hawk. Others may be available to special order, mainly from overseas. However, these are the main types known to me at present. Some of these models are full kits, whilst others are part kits, possibly consisting of fuselage only, with plan and maybe foam cores for wings. Anyway, you make your choice and pay your money.

In the area of built-up wood aircraft, the choice is limited to those produced by Bob Parkinson kits. The main types available are the Regal Eagle, Avro Arrow and Blue Hornet. These kits build into good-looking, semi-scale, fine-flying models. I have seen them flying and they are suitably impressive. If you want a pure Delta, the Avro Arrow would be an excellent choice. It has bags of room for equipment installation, and a basically simple structure.

The third way to enter jet modelling is via scratch building from commercially available plans. The range available is quite large if you take into account the plans services of the USA, UK and German magazines. Types are non-scale sport models and semi-scale aircraft. Plans are available for engine sizes ranging from .049 to .80 cu.in. Building of models from plans is usually the most time-consuming method of construction due to the number of parts to be traced, cut out, sanded and trimmed to fit. Construction requires careful attention to alignment. No different from other aircraft types, you say? With DF models we have internal surfaces that must be accurately fitted to blend smoothly so that the airflow moves as efficiently as possible from inlet to exhaust. The model must be built as lightly as possible, especially in the tail area. Remember that the internal duct work must be smooth and sealed against airflow drag losses and fuel soakage. Most plan designers presume that the builder has sufficient experience to interpret his drawing. Some plans show only the basic structural items. Smaller details and hardware installation are left to the builder to determine.

Designing your own ducted fan model is best left until at least one kit or plan type model has been built and flown successfully. Many building, equipment, installation, engine handling and flying techniques have to be mastered before trying to design your own DF model.

Propeller driven aircraft have been covered from almost every direction, and let's hope that this continues. I, for one, find the aircraft of the 1930s extremely exciting, be they full size types or Old Timer models.

The advent of the jet age spanned a whole new catergory of aircraft, many of them, depending on your view point, very beautiful. Many, of course, are not suitable as subjects for model aircraft. I say this with caution, as there have been several unlikely designs successfully flown as models. Anyway, first build from a kit or plan, and then go and design your own model and widen the field of jet designs.

I have made up a list of most of the plans from overseas sources that I am aware of. The addresses of the organisations that supply the plans are also listed. As most of these plans were originally published in magazine issues over the last 20 years, they will be unknown to many modellers. Included in this list are several non-scale types of extremely exciting designs that are of relatively simple construction and are reported to fly well. Anyone interested in building a different, even exotic, DF model need only send a 41¢ stamp to Fantails at Airborne Magazine and I will send out a list which contains descriptions of more than 30 plans. You can make direct contact with the suppliers. Do not forget to print your name and address.

FAN FLY MEETING

The Leeton 1990 Fan Fly meeting promises to be bigger and better, with 30 or more visiting jet pilots. Plan now for the 13th & 14th October by contacting Jon Hull on (069) 55 1253 [AH].

CORRESPONDENCE

From Graham Reddin of Sylvania Heights in outer Sydney....

"I enclose a couple of photographs of my current fan project, which you may wish to use in your column if you're desperate for material(!). (Yes!) I have been experimenting with small fan units, and the scratch-built Mirage F1 in the photographs is powered by an OS CZ11 pylon engine driving a 3.4 inch diameter fan. The eight-



David Weir with his Corvette, a 20 size model designed and built by David, who is just 17 years old. Uses OS 21 VF with cut-down Micro-Mold fan. Weight is 44 oz, giving a wing loading of 21 oz per sq ft. Three radio controls. Weir senior took the photo.



Graham Reddin's Mirage F1. Yes, a Mirage that is not a delta! Graham's machine is powered by an OS CZ11 pylon engine driving a 3.4 inch diameter fan that he made from prop blade segments. Red and yellow roundels: what Air Force is that?

bladed rotor is made from the tips of GRP propeller blades secured in a plywood hub, with ply stators and a plastic shroud (cut from a small Tupperware container). This combination provides enough thrust to allow hand launching, and allows aerobatics (following a shallow dive for speed). The model does not use a cheater hole; the inlet area is just over 100% of the fan swept area, and the tailpipe conforms to the 'zero contraction' principle. Despite being quite heavy (using a 500 mAh nicad and one full-size servo on the elevator function), the Mirage flys well on its 1.8 cc. I am currently experimenting with a six-bladed rotor, following the original's demise when the starter belt was sucked into the fan!"

NEWS IN BRIEF

L.S.F. TOURNAMENT	Jerilderie, June 1990
Mike O'Reilly	7830
Rob Benton	7808
Eddie Smith	7801
Peter Goldsmith	7796
Scott Lennon	7789
Mal Pring	7686
AIRBORNE Trophy:	Peter Goldsmith
Spot Landing Champion:	Ralph Learmont
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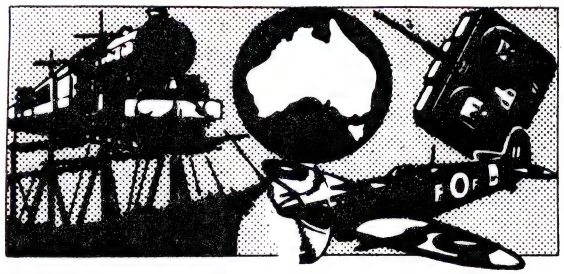
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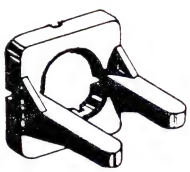
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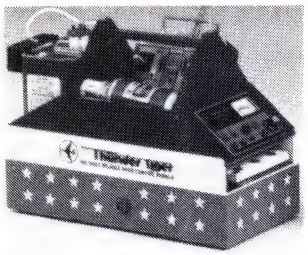


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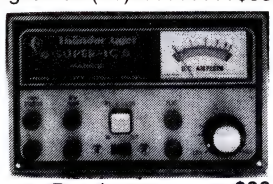


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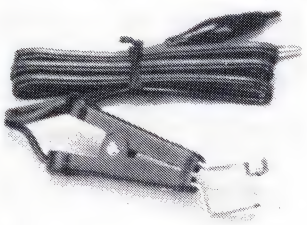
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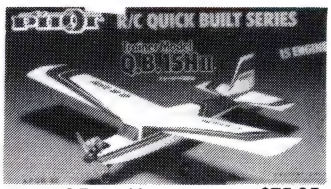
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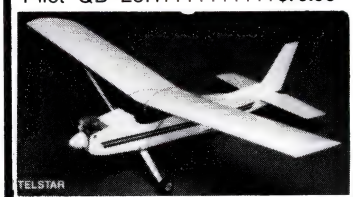


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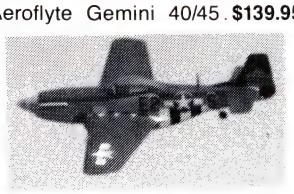
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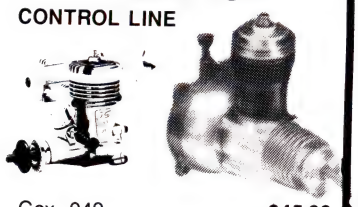
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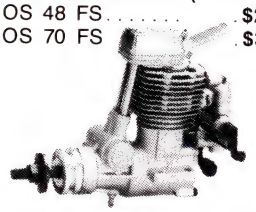
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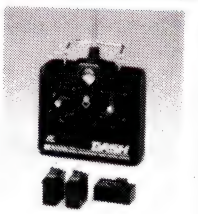
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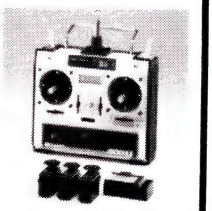
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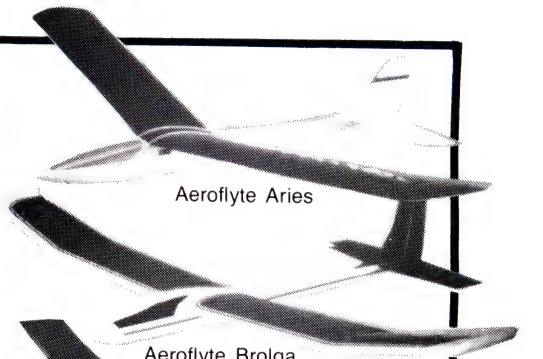




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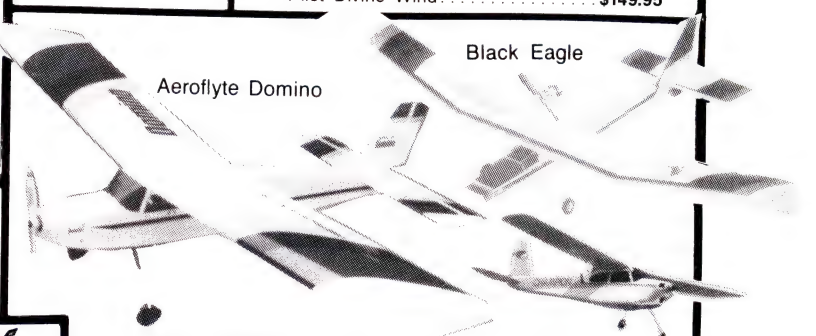






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PYLON ROUND-UP

by John Hughan



A race begins at the SA State Championships. A clear day for pylon at the Constellation field. This action shot by Tom Lloyd.

THE A.M.P.R.A. CHAMPIONSHIPS

The Australian Miniature Pylon Racing Association (AMPRA) Championships took place again this year at Deniliquin over the June long weekend. They was well attended, with a total of 97 entries in the four events. We expected a large gathering, because this AMPRA Champs was one of the selection trials for the Australian World Champs team. We had entries from every state, but not the ACT or the Northern Territory.

The events were held over three days, commencing with Quarter Midget, which are 3.5 cc powered aircraft; followed by FAI, which is the International 6.5 cc engine class. Formula S, which is the beginners' class using 7.5 cc engines, was next, and the last event was ½A Pylon, which are powered by 1.8 cc engines. We were fortunate to have very calm and cool weather. However, these conditions produced fog, and we were late starting on both the Sunday and Monday mornings. This meant that we missed out on one round of FAI, running six instead of the scheduled seven rounds. The pilots understood our problem and did not complain about the loss of a round.

We had our AMPRA AGM on the Saturday night at Harry Bloomfield's house, and 45 members were present. This is the only time that we can all get together each year to discuss pylon matters. There were many subjects discussed, some of major importance. This meeting is very important as it is the only time that we can hear the opinions of each state and the individuals in the state. Even though there was a lot of discussion there was little of consequence that came from the meeting. The two main items were the adoption of the International Scoring System of Seconds, replacing our 200 Points System, and the 50/50 vote in favour of the FAI Scale Interpretation of pylon models.

There was a report given from each state, which indicated that there is continued growth in pylon. South Australia was very impressive, and has recently produced some very fine pilots. Unfortunately, pylon is not very popular in SA at club level, and those pilots may soon be lost to our section of the sport. Sports Pylon rules are being varied from one state to another. In some cases the experienced pilots are joining in with the beginners, to give the newcomers something to aim at and also to make up the numbers. Both are valid reasons.

There was fuel sponsorship from Magnum, and with it two Australian records were set. This *may* prove that Magnum is the top fuel for your engine.



Rick Thoms starting a race. Looks as though he has made it a square dance routine! The pilots appreciate his efforts.

Quarter Midget

This was the first event run, being a lead-up to the World Championship FAI Selection event. Rossi 21s came first through to fourth. This is the first time that this has happened. Usually Piccos get most of the placings. At this stage I believe that the current Rossi is fastest, however, I was told recently that there is a new Picco being released that is much more powerful than the lastest P5.

The winner was Andrew Davies for whom I called. He is running a stock Rossi 21 with an OPS full pipe and a very small prop. His model had fierce acceleration, and even when he was last off the line he was able to catch everyone before they reached number three pylon. This gave me the indication that he was slightly underpropped. After the first lap his excellent flying placed him level with the faster aircraft. With a prop with a bit more pitch he would have run faster times. His engine is stock standard; no fancy heads or plugs. His model was the Langham QM designed Midget Mustang.

QM Results (23 entries)

	Model	Engine	Fastest Time	Score
1. Andrew Davies	Midget Mustang	Rossi	1:17.1	479.4
2. Keith Harvey	Omega QM	Rossi	1:17.6	476.0
3. Bernard McKay	Folkerts	Rossi	1:20.1	473.6
4. Ken Wright	Little Toni	Rossi	1:23.4	456.6
5. Roger Langham	Midget Mustang	Picco	1:20.3	455.8

Fastest time: Ranjit Phelan - 1:15.5 - Midget Mustang with Rossi.

FAI

This was possibly one of the most interesting races I have attended. Australia is on the brink of attaining world supremacy in this class, and I was anxious to see how our top pilots stacked up against each other during team selection. However, it ended up with a cake walk for Ranjit Phelan, who averaged an amazing 1:17.5 for the five rounds that counted. He was flying his own designed Mustang aircraft powered by an OPS 40. He is certainly making that engine work; according to my trained ear it would be about 28,000 rpm in the air. Ranjit, with his fastest time of 1:15.7, now claims a new Australian record.

The other fast performers, Roger (the Rabbit) Langham and Bruce de Chastel, started very slowly, and came home with a rush. Unfortunately, Bruce left his run too late, missing too many early rounds. He made the mistake of running his new Nelson 40 engine that was going very well in Queensland but did not like the Deniliquin NSW, weather. When he changed back to his old Super Tigre he became very fast. Roger Langham had early problems which were found to be due to a home-built needle valve assembly shifting and thus leaning out the engine. Once that was fixed he was off like a rabbit up a burrow, and ended up with second place ahead of his



Craig Jones from SA, and John Chadd from NSW, fuelling up at the AMPRA Champs. Magnum fuel kept everyone going fast.



Terry Zadow from BARCS in Queensland, with his FAI Rivets and ST 40. Deniliquin sunshine did not require wearing of hats, but shades were a help.

father, Lance, who has possibly the most reliable FAI equipment running today. Unfortunately the other fast guy, Ian Haigh, did not put it together for the whole weekend, suffering cuts, flame-outs and no starts.

FAI Results (36 entries)

1. Ranjit Phelan	Mustang	OPS	1:15.7	612.7
2. Roger Langham	Midget Mustang	OPS	1:16.7	588.9
3. Lance Langham	Midget Mustang	OPS	1:20.7	582.6
4. Brian Steele	Midget Mustang	OS	1:19.1	578.9
5. Keith Harvey	Little Toni	OS	1:23.3	574.4

Formula S Results

1. Harry Bloomfield	Local Design	Picco	1:47.4	364.0
2. Brian Taylor	Local Design	OS	1:46.8	353.2
3. John Duggan	China Clipper	YS	1:45.4	352.5
4. R. Porter			1:52.0	323.7
5. P. Wheeler			1:50.4	318.5

½A Pylon

I was rather interested in this event because I wanted to find out what developments have transpired outside Victoria. I was not disappointed, because the NSW Enya 11s were very fast. The ST 11 engine, which dominated in the past, is now having problems keeping up with the pack. Actually, the armchair experts stated that the model flown by Karl Hague, powered by an OS CZ, was the fastest at the meeting. This did not stop Ranjot Phelan from taking out the Australian record with a 1:21.8

½A Pylon Results (23 entries)

1. Ranjit Phelan	NSW Design	Enya	1:21.8	457.2
2. Lance Langham	Capella	OS FP	1:26.9	451.2
3. Roger Langham	Capella	OS FP	1:27.9	442.7
4. John Hughan	Capella	OS XP	1:29.0	430.6
5. Eddie Rich	Capella	ST	1:32.3	409.0

Formula 'S'

I do not usually write about unfortunate accidents, but I just could not believe what I saw in this event. The two instances of ground collisions during take-off, and two mid-airs, just about wiped out the whole field. There is skill in avoiding mid-air collisions; it is learnt with experience. It amazes me that for all the pylon laps that are flown, and the close racing that is normal, the frequency of mid-air collisions is so low; we hardly have any at all. However, when we get to the beginners' classes there are quite a few.

When racing there is a responsibility by all contestants to stay out of the oponents' way. You must increase your span of vision. If you feel that you are about to be passed, stay in the one level of flight; do not take evasive action. It is the responsibility of the passing pilot to make sure that he does not hit. There is nothing worse than two aircraft taking evasive action at the same time, especially when they both go in the same direction and collide! Remember, the slow model stays level; the passing model does the dodging. Also, do not panic when you are being passed; keep a level head. From memory there were 92 heats run in FAI, QM and ½A and there was not one mid-air. Formula S copped the lot.

The enthusiasm in Formula S is something that is not experienced in other classes. It is very infectious, and that is why I love to be involved in Formula S racing by being at the start line. Unfortunately, this enthusiasm is nullified by the lack of preparation by many of the pilots.

To be successful you must plan ahead. Make sue that everything is simple and works perfectly.

Check that:

1. the glow plug works;
2. the engine is not flooded;
3. the tank is filled;
4. the glow driver works;
5. the starting clip is effective and the best that money can buy;
6. you have a good 12V starting battery.

Also, practise your starting technique. NO (Show-off) flick starts - they are too unreliable. All you have to do is get in the habit of checking all the above and you will be sure to get airborne every time.

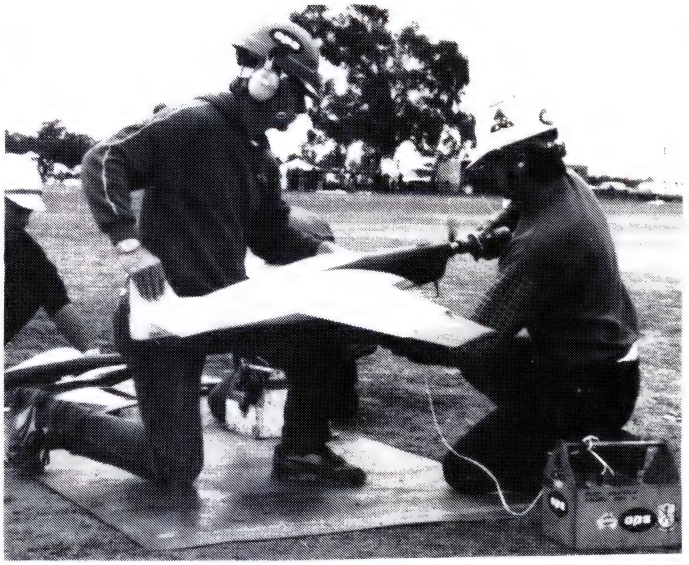
There is no doubt that the best three pilots finished with a place. Brendan Taylor and Harry Bloomfield fought it out all day, with Harry coming out the winner. Harry flew a very fast aircraft, but it did not seem to handle as well as Brendan's, and this enabled Brendan to catch up. Third was John Duggan, ex-racing driver and Thunder Tiger importer, flying a China Clipper powered by a very fast pumped YS 45.



Karl Hague with his OPS powered FAI Little Toni. Ran a 1:20 in his very first race. At 16, is still a junior! Has two VH numbers, too.



The man that gave the Yanks a fright at the last Pylon World Champs. New Rivets model has Nelson 40 running a 7¾ x 7 prop. Ailerons are between inscriptions and edge of the wing.



John Chadd hangs on while AMPRA Grand Champ Ranjit Phelan applies the starter for a heat in FAI. OD Mustang has OPS engine (modified, of course).

Champ of Champs

Without a doubt the star of the meeting was Ranjit Phelan. He entered 3 events, won 2, set 3 fastest times and two Australian records. Not a bad weekend! I wonder what would happen if he was really trying. It's great to see Ranjit back in the action and doing so well.

Sponsorship

I must thank the following for their support of AMPRA, because they make it possible: Bolly Props, Avionics, Super Cool Props, Model Engines, Hobby Hangar, Bryzen's Hobbies, PriceRite Engineering, Model Flight, Model Sports & Hobbies and Magnum Fuel.

Deniliquin also gets a big wrap for running a hassle-free event: no protests; no arguments; just efficient running. Thanks to the Deniliquin ladies for the catering and the great meal for all contestants on the Saturday night. Also, a big bouquet for my mate, Whispering Rick Toms, the No. 1 starter in Australia, who waved off every heat.

The AMPRA Champs is not to be missed. It is the biggest and best pylon meeting in Australia. Next year it will be at Cohuna, Victoria. See you there.

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If you have not paid your dues, send $10 to: **John Hughan, 92 Hawthory Road, Kilsyth, Vic., 3137,** to get a complete run down on competition results and pylon news.



Phil Organ with a very nice Murphy Mustang for FAI. Uses OS engine. Could that Rx antenna be hidden away?

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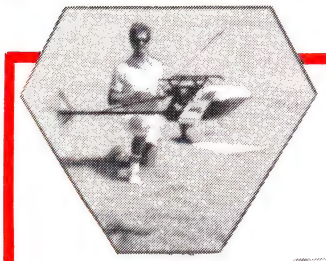
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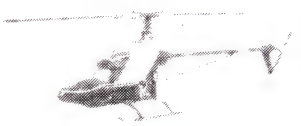
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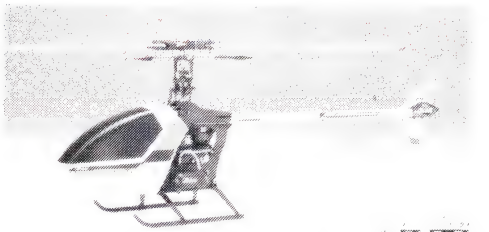
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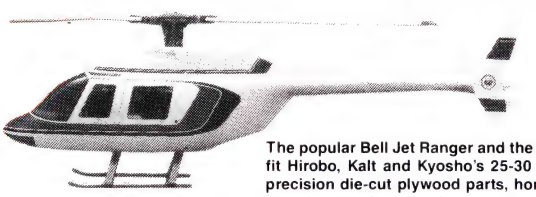
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TO BE A MODELLER

by Vin Masters

Episode 6

Vin Masters' discussion of plans takes you from modelling towards engineering.

CORRESPONDENCE

This section was written in response to a query from a reader who ordered a plans list which was sent in the SASE provided, but who did not give his address on the letter, and whose signature was not clear. However, the problem outlined has probably been encountered by more than 10,000 modellers (more than that number of Hustler kits have been produced) and is very important. To quote from the letter ....

"I am just starting in RC aircraft and am building an Aeroflyte Hustler to learn on. When balancing the model, it is done dry, I presume (sic), and what happens when you have it set ready to fly with 8 oz of fuel in it, the balance point is way out.(?)"

The answer is simple: go to an experienced modeller for flying instruction and he will sort out the problem. There is not much chance that a new pilot could teach himself to fly with a Hustler with 8 oz of fuel aboard. The best model for self-instruction is a low powered 2 metre soarer with a 1 oz tank, and not full of fuel to start with. Don Howie has explained it in the previous issues, in this column.

For the Hustler style of flying you need an instructor. Period! Anyone who can quote me an exception will probably also prove the point. It would be interesting to hear such stories, which may be sent to me via the Editor.

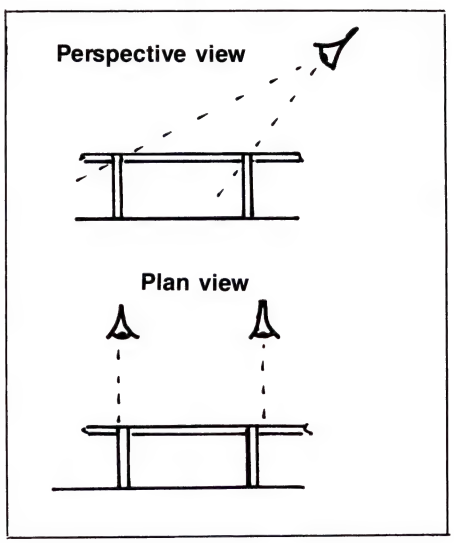
COMING TO TERMS

In any technical endeavour, progress depends upon understanding ideas that are more and more advanced. Once the basic concept of cutting, joining and shaping has been mastered, for aeromodellers it is usually with balsa wood as the construction material, it can be applied to other materials. For example, model aircraft are now composed more of plastics than of wood. The newest designs are entirely of fibre reinforced polymers such as fibreglass, carbon and Kevlar, to use the common terms. Model railway engineers do it all with metals.

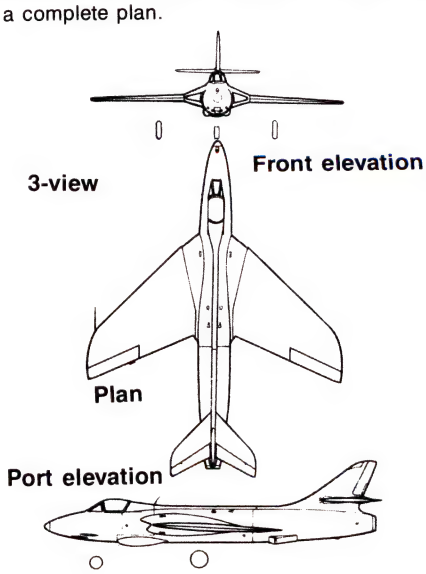
There is one communication technique common to all engineering disciplines, and it often overcomes the language barrier of the written word. That technique is the engineering drawing: to aeromodellers it is the dyeline plan of the model. Being able to read plans is essential to the model builder, and is beneficial also to the flyer who usually buys the models he flys already built.

The ability to read, and draw, plans is based upon a convention of symbols, just as is any written language. For aeromodellers the convention is quite simple, and thus easy to use. This important feature of simplicity is complementary to the basic requirements that a plan should have. These are: firstly that the drawing should be accurate; secondly that it should show components at their exact size; and thirdly that it should show the precise relationship of the components. Dimensional accuracy is acceptable if an error is no more than the thickness of a line. Sometimes, to show any components to size, a separate diagram is done to prevent confusion with the parts adjacent to it in the complete diagram.

How these aims are achieved relies upon the point that the drawing shows a three-dimensional structure in two dimensions by using plan display instead of the perspective display of classical art. This means that the parts of an object are projected vertically onto an horizontal surface, so instead of seeing different parts at different angles, all parts are shown as they would be seen from vertically overhead.

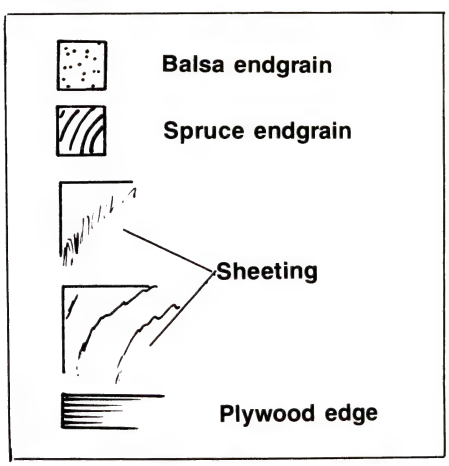


This technique is then developed to show different aspects of the complete object, each aspect at right angles to the others. The vertical overhead diagram is the actual plan, according to the definition; but other aspects show a side view and an end view of the complete object. These views are called elevations. Thus, for a model aircraft there is the plan view, a side elevation and a front elevation, giving rise to the well-know term, a 3-view. Each 3-view constitutes a complete plan.



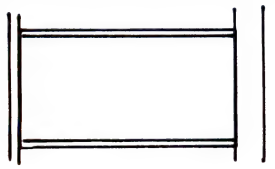
With the three basic aspects differentiated, the next step is to distinguish different materials. This can be done with written descriptions on the diagram, and is supplemented on the drawing itself by the use of symbols. It is of great assistance to drawing and reading plans when the following symbols are used.

Since wood has a grain this can be shown by lines, drawn freehand, along the direction of the grain. This is well illustrated on the Gumnut plans in this magazine. When the wood is cut across the end grain is depicted as a stipple, for balsa, or as growth rings for softwoods such as spruce and pine. Similarly, the surface of wood sheeting may have the grain drawn, particularly for plywood where the growth rings, cut at a very shallow angle, resemble tide marks on a beach. When the plywood is shown edge-on, the layers are usually depicted, although only at the limits of the ply to avoid the heavy linework when shown fully.

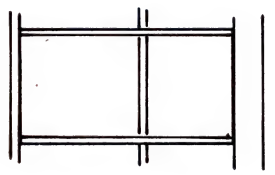


Metals are sometimes shown as solidly inked areas, since such components are usually very small and not obtrusive in the overall drawing. Plastic components, such as control surface hinges and horns, are shown in outline, which identifies them unequivocally. The same method is usually satisfactory to identify screws, bolts, clips and other items, since they have characteristic outlines, in either plan or elevation, that identify them. On very detailed plans, the positions of engine and radio control equipment are shown in the same way, but it is more usual to omit them to avoid cluttering up the plan.

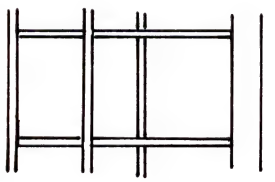
The plan thus consists of accurate line diagrams with drawing symbols to identify the materials used for construction. A plan has to have one other important property or feature, and that is to show the arrangement of parts that are hidden from direct observationn, when the structure is viewed as a whole. The technique is simple, although it can lead to difficulty in reading the plan. The method is to use broken lines; dots and dashes. The following diagrams show how it is done.



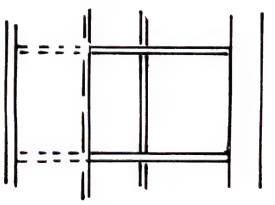
Wing panel with LE, TE and rib.



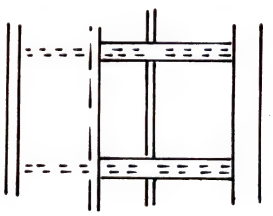
Wing panel with bottom spar added.



Wing panel with top spar added.



Wing panel with wing sheeting.



Wing panel after addition of cap strips.

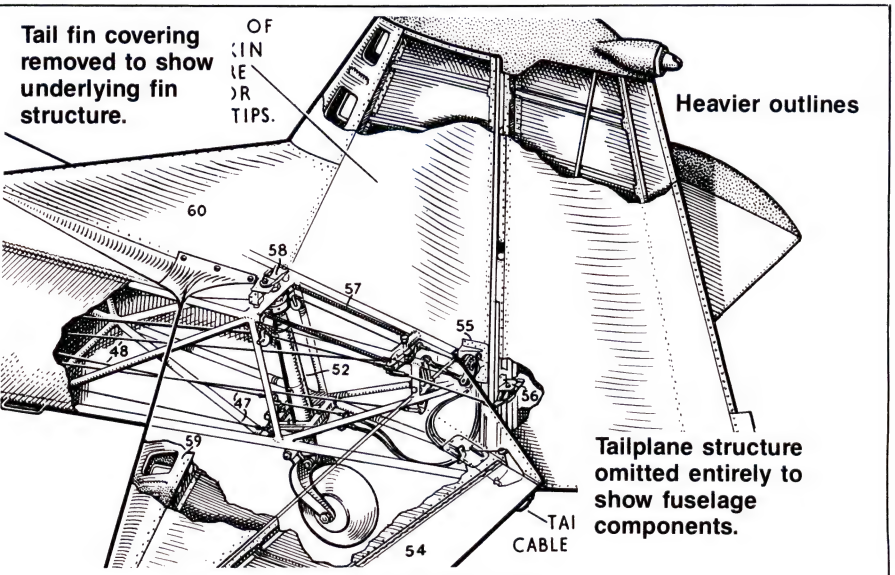
There are other techniques used to distinguish special features of a plan, although not all of them need be used on any plan. Each may be used when it is appropriate, for achieving the aim of clarity.

Filling in to show basic framework.

Edges shown with solid triangles, viz: ▲

Heavier outlines for major components.

Sometimes hidden structures are simplified by depicting part of it with the covering removed, so that broken lines can be drawn as continuous lines, making the shape and fit of the parts much clearer. This technique is used most often for sheeted wings.



Auster A.O.P.9. perspective view

With the same intention, some parts can be omitted to allow the sub-structure to be drawn in detail, as if the plan was drawn before the construction was finished. Infrequently, a perspective diagram may be done beside the plan to show the general arrangement of the parts, and sometimes those parts are separated from each other as if the final assembly had exploded apart.

On other plans the extra diagram is done on the top of the plan drawing itself, and space is allowed by omitting part of the true scale diagram with the ends of spars and ribs shown as if they were broken. During construction the actual spars and ribs are laid down as if the plan was continuous over the extra diagram.

Model aircraft structures are relatively easy to modify, and sometimes a plan will indicate alternative or extra construction parts. This is usually done with broken lines and a note giving details of the change.

Finally, the plan has to have sufficient written information to enable complete interpretation of the language of the diagram itself. Such notes are always brief. Technical terms are used to full advantage, and abbreviations are common. Each note is located as close as practical to the area it refers to, and an arrow shows the point of its application.

From Reading to Drawing

Because communication is a two way process, it is as important to consider drawing plans as it is to consider reading them. The main points to be shown on a plan have been described, and a brief account of the drawing process will complete this discussion.

For a plan that will be used by the designer only, black pencil or ball point pen linework on white paper is sufficient. The drawing must be accurate, but no detail or descriptive notes are needed, because the detail is sorted out as construction progresses.

If such a plan is to be submitted for publication, then the detail has to be written in so that the plan can be traced onto the proper paper, making a master copy. The master is given all the detail that may be only alluded to on the draft copy. If the tracing is done by someone other than the designer, the designer's copy has to give full details of everything to the copy maker.

For publication it is better if the designer does the whole plan. Firstly, an accurate draft copy, then the tracing on the translucent paper, obtainable in rolls from better stationery retailers. This master copy should be done with ink pens and India ink. These pens need regular cleaning but produce a far superior line when compared to the ball point pens, drafting pencils or black lead pencils. Ordinary biro ink and pencil lines smudge easily and need to be fixed with a spray. To erase a line it should be scraped away gently with the corner of a razor blade. Erasers do not work! Ink pens have different nib sizes to give lines from 0.2 to about 2 mm. For model aircraft plans 0.7 and 1.5 mm give good lines, the thicker one for outlines only. All lines should be ruled. A straight edge with a bevel is needed for ruling straight lines, so that the nib reaches the paper. Curves should be done with the appropriate template, and circles should be done with a pair of compasses. There are plastic templates available to provide a great variety of curves in different sizes: French curves, circles, ellipses, squares, triangles; and lettering templates too. Placing and removing a template requires care to avoid smudging the ink, which usually dries in a few seconds. Do not blot the ink dry: it spreads! Lettering is done best with templates, but it is very tedious, and a legible hand-written script is adequate. Templates are usually reserved for the name of the model, the credits (designer, draftsman) and the specifications.

Drawing a plan requires a good, flat surface with good lighting. The plan may need to be taped down for several days before completion, so an area safe from other uses is needed. When the plan is completed, take a rest before checking it over. Extra notes to clarify a point may be added.

The plan should be rolled for transport. Do NOT fold it! A good plan reveals a good designer and good communicator. It may not be a work of art like the AIRBORNE plan of the Winter Special done by David Gregory, but producing a good plan ranks with the achievement of producing a good model.

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All Deans and Caldercraft Kits have scale moulded hulls and superb metal fittings. for 2 ch RC and electric power.

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VIDEOS

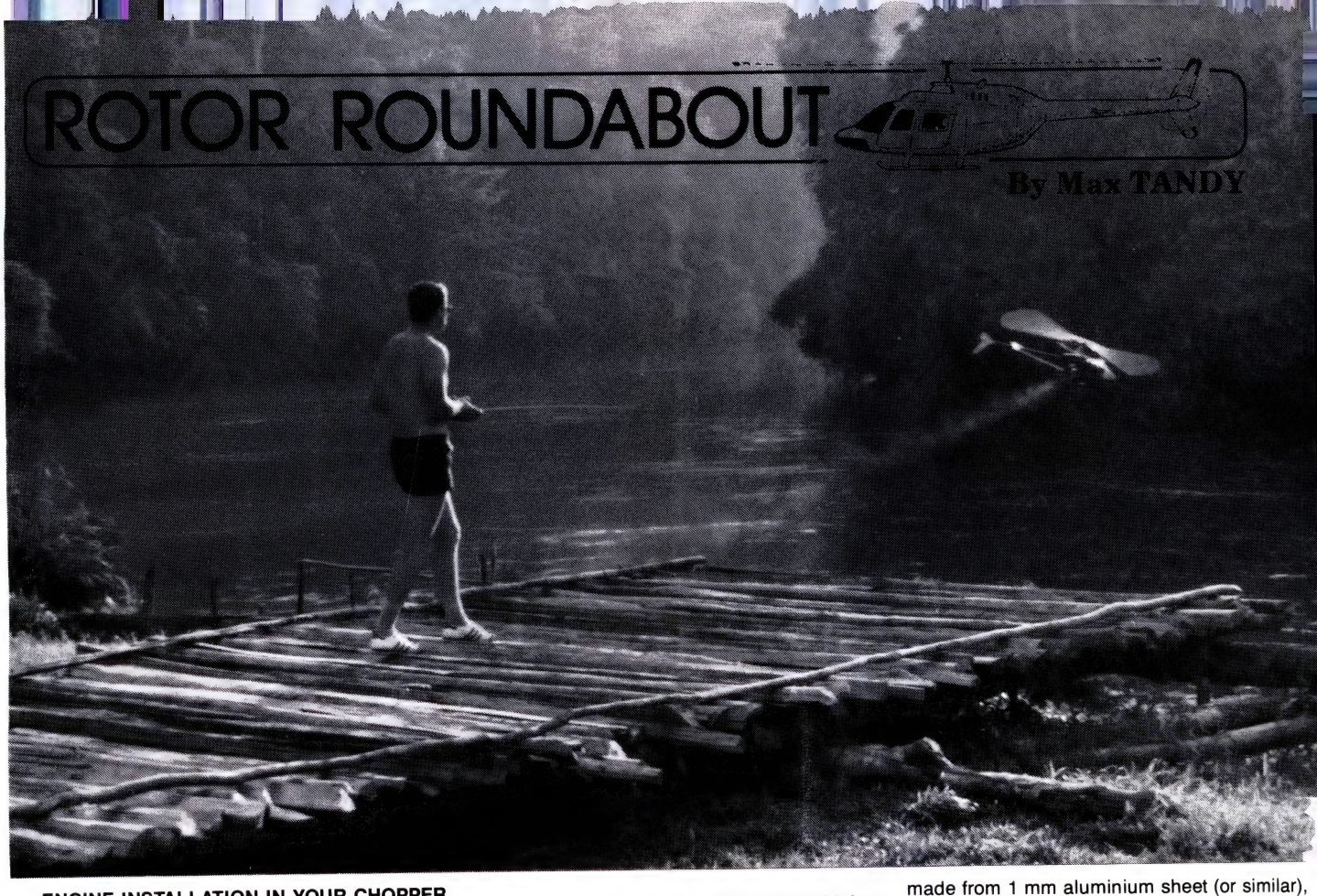
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ROTOR ROUNDABOUT

By Max TANDY



Mark Lucas heads out for a sortie on the Nubi river in New Guinea, with his X-Cell 60. Jungle-shrouded river is at 1600 feet altitude, temperature is 30° and humidity over 90%. What a scene! No space for fixed wingers here!

ENGINE INSTALLATION IN YOUR CHOPPER

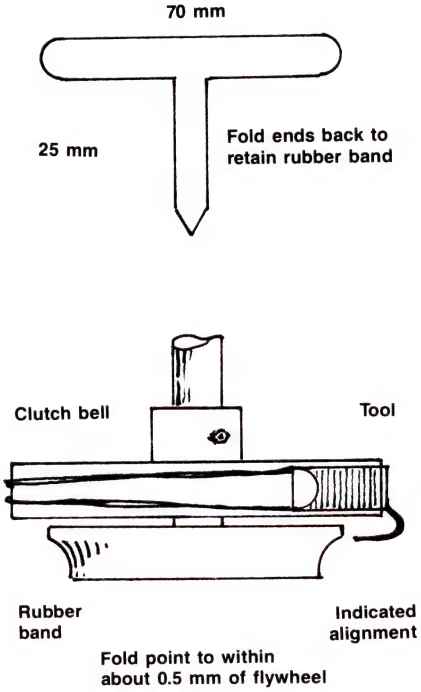
Any helicopter enthusiast will tell you how important it is to have the engine correctly lined up in the frames of the beast. Chewed up clutches, bearings, shafts and the like are often the result of a crooked engine, where the poor old clutch has to be a universal as well as doing its intended task. Even factory assembled choppers suffer the same fate. Stephen Green from Leongatha in Victoria has come up with a unique little device that can be very simply made and effectively used to check the engine to clutch bell alignment when the engine is being fitted.

ENGINE ALIGNMENT TOOL

by Stephen Green

A problem faced by most helicopter owners at some stage is that of clutch alignment. This is an area where accuracte assembly is critical, in order to reduce vibration, to ensure long clutch and bearing life and to prevent fuel foaming. A conventional dial indicator can only check flywheel and clutch to crankshaft alignments. Of course, both these are also important and should be checked for axial and radial runout during clutch assembly.

When installing the assembled engine-flywheel-clutch into the frame of the helicopter, it is very important to ensure that the clutch bell to flywheel alignment is satisfactory. A visual check from the side and rear will give a rough indication but for good accuracy, some method of attaching an indicator to the assembly is needed. For years I've simply cut a piece of masking or electrical tape to a point and stuck it to the clutch bell so that the point is aimed at the flywheel. However, it is difficult to stop the tape from moving at the tip. A couple of weeks ago I finally made a simple tool which I'd thought of years ago. It is easily made from 1 mm aluminium sheet (or similar), folded as required for your particular application. Attach the tool to the clutch bell with a rubber band and adjust it so that a very small gap is showing between the point and a corner on the flywheel. While rotating the clutch bell, usually in 90 degree increments, observe the gap, which should always remain the same, both horizontally and vertically. Adjust the engine or pinion as required to achieve good alignment. Patience and care will be well rewarded. I have included a sketch of the tool.





Steve Green's engine aligning tool. No need for a Birmingham spanner now! See text for explanation.

MY X-CELL 30 HELICOPTER

by Alfred Heck

First of all I'd like to quote the specifications of my helicopter:

Weight with 1200 mAh battery and gyro: 3.2 kg
Engine: SS 30, with Magic Muffler exhaust system
Fuel Used: 80% Methanol, 20% Castrol M Oil

Radio: JR Max Computer; Futaba 154 Gyro at 40%
Collective Pitch Range: Low -2°; Hover 3.5°; Hi-Pitch 6.5°
Rotor RPM: 1600 with good blue smoke & engine 2-stroking
Paint: Dulux Acrylic, metallic blue, dark pink & white

Performance Comments

This engine size delivers plenty of power in the trainer version, but you should go to a 40 size if you add a scale fuselage and want to keep it fully aerobatic. (A 40 engine would give you all the power you will ever want.) This would have to be the Rolls Royce in small size helicopters, since it uses the 50 to 60 size rotorhead and tail rotor. Plastic bushings in the rotor head are more than adequate, and after 4 litres of fuel I have found no wear whatsoever. (I check my helicopter after every flying session. Do you?)

Criticisms: Mine was one of the first kits to arrive in Australia, so these criticisms should be taken with a pinch of salt since they may have already been rectified. The clutch lining was too big and not machined in the clutch bell. My clutch wouldn't even fit into the clutch bell, so some lathe turning was necessary. Main gear was lumpy. (It has smoothed out now; it just took a while.) The hexagon which is machined on the end of the starter shaft was 4 thou out. This is the part that engages the clutch. You have to remember that it was just 4 thou, and most flyers wouldn't even notice that (Max knows that I am very fussy.) Anyway, Max replaced it within 2 days of my phone call, absolutely free of charge. Now that's service. After the replacement no vibration was evident any more.

5 Months Later. The helicopter has now been upgraded to a 40 size engine since I want to fit a scale fuselage in the near future. The available power is now more than you would ever need. To this stage the X-Cell 40 has had 15 litres of fuel through it with no mechanical wear or failure except for the clutch, which chewed out the hexagon part. Again Max replaced it instantly, free of charge. Apparently the first clutches were machined out of inferior material. This has now been rectified and the new kits should be perfect.

Building the Kit

Stick exactly to the instructions. Don't deviate from them and the chopper will go together in no time. Set the pitch range exactly as recommended. This will make it fly nicely, and then you can modify it to suit your particular engine, should you want to.

Flying

This helicopter is hampered only by my ability, and I will probably never know exactly what is possible with it. There is no control delay at all; the reaction is instantaneous, but very smooth. At one moment you're hovering and the next you are boring holes in the sky. When I was in Jimboomba a lot of people showed interest. All I can say to them is that you can't go wrong in purchasing this chopper. Now, after 12 months of flying, there seems to be no wear or deterioration. The helicopter has had no crashes or bumps, and has taken me into flying circuits, stall turns and nose-in hovering.

One final thing that I'd like to say. You guys should not go out and buy ball bearings to exchange those little plastic bushes straight away, because the plastic ones are smooth and reliable if lapped in as the instructions say.



A big one visits Mark Lucas at Gobi in New Guinea. Mark is a heli maintenance engineer, and travels all over! Can you spot his model?

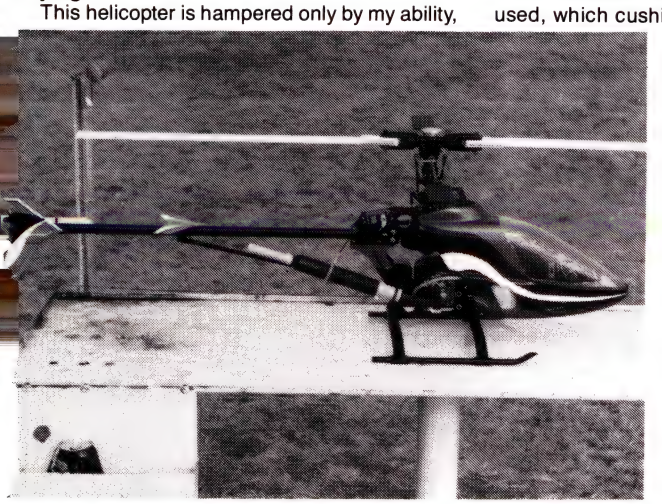
LANDING SAFELY WITHOUT YOUR ENGINE

During the learning-to-fly process, an engine failure usually results in little or no damage to the helicopter, mainly because the pupil is hovering fairly close to the ground, at about eye level. In most cases a training undercarriage is being used, which cushions the fall, even from up to 2 or 3 metres from the ground. As the pupil progresses into forward flight and begins flying around at appreciable heights, the consequences if an in flight engine failure change significantly.

Auto-Rotating your Helicopter

An intentional auto-rotation is quite a traumatic experience for the intermediate pilot when trying it for the first time. In most cases it will be successful, providing that the helicopter has been set up correctly to enable the rotor blades to spin up during the descent stage of the manoeuvre. However, an unexpected engine failure prior to learning the auto-rotation technique will, in most cases, result in a very damaged helicopter.

This can be avoided! Most of today's helicopters have the ability to auto-rotate should the engine stop in flight, but just havinbg the auto-clutch fitted to the helicopter to enable the rotors to spin freely while descending is not enough. It will crash if the correct negative blade angle is not available to be selected immediately the engine stops. If you want to save your helicopter by auto-rotating it to the ground should the

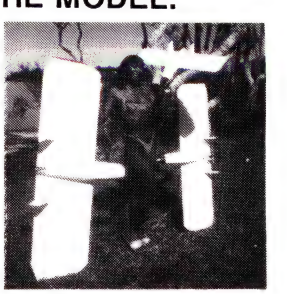


X-Cell 30 by Alfred Heck of Port Macquarie. Special metal table outdoors kes excellent helipad.

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"A FLYING WING LIKE NO OTHER"



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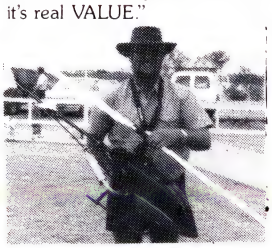
Robert Barbuto
Current Australian Champion. Flying for Australia at the recent World Championships was very satisfying.
A Reliable helicopter is Essential to Everyone in this Sport.



John Wessel
1990 Victorian State Champ. I fly a lot of Competition, and in hundreds of flights my X-Cell helicopter and JR Radio have not let me down.



David Hatfield
1990 Queensland State Champ and Newcomer to this Sport. "Being the only Heli flyer in Mackay, I fly for my own Enjoyment. I learnt the lot with the X-Cell, from scratch. It's not the cheapest Heli, but it's real VALUE."



Bob Newcombe
1990 Qld State Runner-Up "Extreme price differences of helicopters made my choice Agonising! Then I considered 4 points: Firstly the Views of 5 Experienced flyers; second was the availability of parts and service; third was Durability of the helicopter while learning; and fourth was It Must Maintain Performance after many hours of flying. My choice was X-Cell and I have Never been Disappointed. These are MY words."



Using ultra high-tech materials and technology, the X-Cell 40 & 60 machines have set standards that others will strive to achieve. The instruction manual is bigger than this magazine, and has 40 pages of **real English, leaving nothing in doubt.** The plans are clear, precise and easy to follow. A total of 46 sealed ball bearings are supplied in the kit. Probably the best news is that people starting out in helicopters can now do it all on one machine. This is by far the BEST HELICOPTER THAT A BEGINNER COULD SELECT.
WRITE OT PHONE FOR OUR BROCHURE.

THERE'S AN X-CELL IN YOUR FUTURE!

X-Cells CONTINUE TO DOMINATE IN AUSTRALIA
Results of the 1990 Qld. State Champs are:
Expert Class - X-Cells 1st, 2nd, 3rd, 4th, 5th.!!!
Novice Class - X-Cells 1st, 2nd, 3rd, 4th. .... !!!
And in 20 to 30 mph winds!

1990 Victorian State Champs:
Expert Class - X-Cells placed 1st & 2nd against All Comers
Intermediate Event - X-Cell placed 2nd.

X-CELL Helicopters Sweep 1990 US Nationals:
1st place — Cliff Hiatt, X-Cell 60
2nd place — Wayne Mann, X-Cell 60
4th place — Curtis Youngblood, X-Cell 60

And this impressive list goes ON and ON .....

IN THE WORLD OF MODEL HELICOPTERS, WINNING MEANS JUST BEING ABLE TO FLY ONE, AND THAT IS WHAT X-CELLS ARE ABOUT — YOU CAN FLY!



Rob Barbuto (right) 1st place '89 Nats; Geoff Woodward (left) 2nd.

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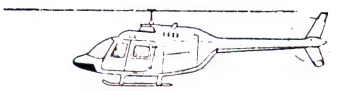
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Telephone: (075) 46 0139; Fax: (075) 46 9977
Victorian Representative: Mike Christoph, The Hobby Consultants; (059) 68 8293

engine fail at any stage of learning forward flight, the correct negative rotor angles must be set into the mechanics of the machine, and without the need to operate switches.

Setting the Auto-Rotation Angles

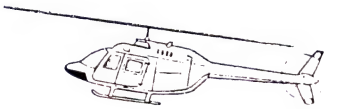
The general collective pitch angles of the rotor blades for circuit flying would be typically – 2° at low pitch and + 7° to 8° at high pitch. The important angle that is required for the helicopter to auto-rotate is the low pitch angle, and will vary from model to model, but is usually in the region of – 4°. The actual negative angle will be found in the manual of the particular helicopter. The high pitch angle is not critical for what we are doing, because the aim here is to save the chopper from serious damage if the engine stops in forward flight. This is not about learning precision auto-rotation landings; it is an **emergency procedure** to save your machine!

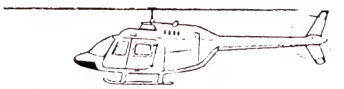
EMERGENCY AUTO-ROTATION PROCEDURE



Engine stopped, collective pitch full down!

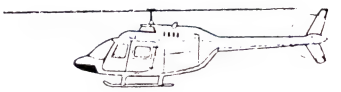
Nose too high; correct this





GOOD! Descending quickly; rotors are spinning.

First pitch pull slows descent



Normally controlled. Touch down using remaining collective pitch.



Helicopter Radio Sets

Most modern heli radios have a Throttle Hold switch for practising the auto-rotation landing. When this switch is activated it usually has the ability to change the low pitch setting from, say, -2° to -4°. This little luxury allows a soft collective feel for regular flying and then the extra servo travel for the auto-rotation, when selected in flight. However, when the novice pilot is learning circuits (a long way from learning auto-landings), if the engine does quit there is not the time available to fumble for the throttle hold switch to select the correct blade angle to save the model. An engine failure at a height of 30 metres usually takes only about 4 or 5 seconds to landing, therefore it is desirable to have to move only the throttle-collective pitch control to the low pitch setting of about -4°.

Emergency Landing Procedure

Immediately the engine stops the rotors will begin to slow down. We don't want this, so the first action is to reduce the collective pitch to the pre-set lower angle by quickly pulling the control stick all the way back. If the helicopter is moving forward in a level attitude at the time the engine stops, the helicopter will go straight into auto-rotation and descend rapidly. Your job is to keep the helicopter fairly level during the descent using fore and aft cyclic control. If the nose stays up during descent the descent rate will slow and the rotors will lose speed and stop! Before explaining the landing procedure we will consider a more awkward attitude to experience an engine failure and still get the helicopter into the auto-rotation mode and descending. A nose high attitude and climbing is probably the worst you would experience because, if the engine stops, the rotor speed and forward movement will decay rapidly. Under these conditions the nose must be pushed down immediately after reducing the collective pitch all the way down. A delay of 2 seconds may leave you with no cyclic control (no rotor speed) with which to get a nose down, diving attitude. Once the diving attitude is obtained the rotors will quickly accelerate, then the heli is levelled and the descent maintained.

Although auto-rotation is best performed into wind, attempts to turn into wind would be disastrous unless a lot of height is available, like 100 metres! So forget turning and concentrate on the job at hand.

The All-Important Landing

Even if you botch this completely there is a good chance that your damage will be considerably less than with the alternative set-up; that is, normal flying rotor angles, so the way I see it is that you have everything to gain and nothing to lose if you adopt the principle of setting up your helicopter for emergency auto landings.

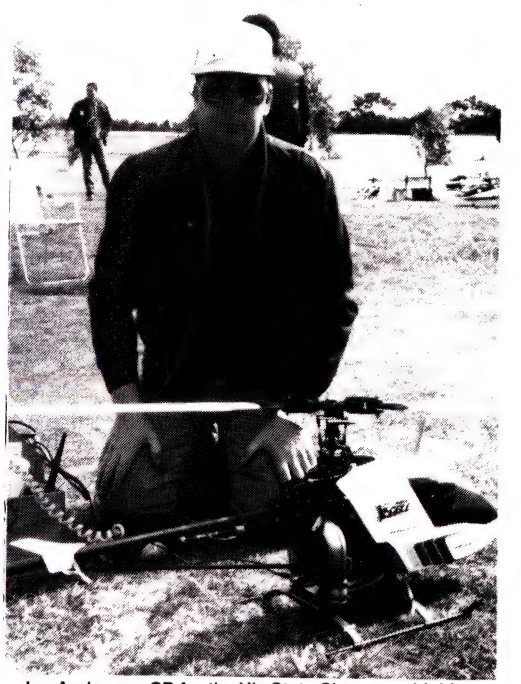
Here we go! If we explain what is happening and why then you will be more confident that you can execute the landing successfully if necessary. Let us assume that your helicopter is descending rapidly and the rotors are spinning. If you have not seen a model helicopter auto-rotate before it can be a little frightening because it is actually descending at a similar rate to falling. The high negative angle we have on our rotors during the descent is allowing the airflow to pass through the rotor disc, therefore offering little air resistance. (If I may borrow an expression from a prominent modeller: "Gliding like a well-trimmed tool box" - thank you Basil.) OK. Now the ground is getting close so we must slow this thing down or it will be back in kit form.

Stage No. 1 is simple. At about 4 metres (the height of 2 people), we release the parachute! Don't laugh; please keep reading. At the point about 4 metres above the ground, quickly raise the collective stick about one quarter of the way up the transmitter, and the whole rotor disc becomes a huge air brake. Air is no longer passing through the disc because the blades are now flat to the airflow, and the helicopter will very noticeably slow down to a point where you can again become a helicopter pilot and have normal control of the touchdown.

Caution: If too much collective pitch is applied at Stage No, 1 to slow down the descent rate, something like one half of the total stick travel, the helicopter will probably stop about a metre above the ground and immediately go up again to about two or three metres. From this position a soft landing cannot be made because the rotor speed will have decayed to almost nil.

Summary: Successful auto-rotations can be accomplished, by relative novice pilots, after an engine failure, providing that the appropriate rotor pitch angles have been set into the helicopter to correspond with the low pitch position on the transmitter. The procedure is to lower the collective pitch immediately the engine stops, and hold the helicopter level during the descent. As the helicopter approaches the ground, an initial pitch pull is applied to slow the descent to a point where a normal landing can be accomplished. See accompanying diagram.

To Stephen Green of Leongatha in Victoria, and Alfred Heck of Port Macquarie, NSW, we thank you for your contributions to this issue. In the next issue, No. 102, we have details on how to convert the Hirobo Gazelle shrouded tail rotor to a conventional tail without dramatically changing its appearance. We also have some good advice for people contemplating getting started into RC helicopters. If YOU would like to contribute to our column, please write it down and we will use it. Photos, if in colour, should be of good contrast, with the background as plain as possible. All photos shall be returned (undamaged) at your request if you supply an SASE. Please send all letters and photos to: **Max Tandy, 9 Smailes Rd., Jimboomba, Qld., 4280**



Ian Anderson, CD for the Vic State Champs, with his X-Cell 60. Vic State Champs pics from Barry Low.

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SAFETY SERIES

GOT THE ITCH?

by Len Williamson

After a stint of building, some of us have experienced a mild skin irritation, usually on the soft skin between the fingers. As the next phase is at the field, flying and trimming, the workbench remains unattended and, unless we experience a catastrophe (alas, not unknown with a new model), the glues, dope and enamels remain sealed in their containers and the irritation quickly vanishes. However, for the dedicated the building may continue. Depending on their body chemistry and the materials they are using, these enthusiasts run some risk of contracting allergic contact dermatitis. It sound horrible. It is horrible!

Dermatitis may appear in several forms. Mostly in the workplace we encounter irritant contact dermatitis, which results from de-fatting of the skin by solvents. Since I can't see how aeromodellers will be involved in such conditions, this writing focusses on the more probable allergic contact dermatitis. In case you think the subject is academic, there were 131,150 reported compensation cases for all forms of dermatitis in the period 1983-84. This figure would be at least doubled by including non-reported cases, so it is almost certain that some readers of Airborne have experieneced dermatitis in one form or another.

What are the **symptoms** of allergic dermatitis? Initially the appearance of patches of red skin, followed by an area, which may be large, of blisters. Just to cheer you up, only 25% of all cases clear up completely. The thing is not to get it in the first place!

Lists of **causative chemicals** for allergic dermatitis are published from time to time, and I have been through one such list to find out how we aeromodellers could be affected. The dangerous materials are: acrylic and polyurethane paints and lacquers; and epoxy resins.

Just how many readers are still with me I don't know, but for those who have lasted so far we now reach the important bit. That is, by what process does the disease develop? In a simplified form it goes like this:

1. Contact is made with the causative agent in a period that may be measured in days to years. No clearly defined symptoms may be visible, as the chemical penetrates the skin, reacts with cells which are then transported by the blood throughout the body where they proliferate. This establishes a memory in the immune system.
2. If, after a period away from the chemical, we again come into contact with it, the immune system memory is triggered quickly and the symptoms occur. Note that only small amounts of the agent are required to set in motion the response, and that the process can continue ad infinitum.

Those of you who have kept up to date with health and safety precautions will not need to be told how to handle acrylic and polyurethane or isocyanate coatings. You must now accept that, in addition to the solvent hazards arising from the formulation, it is necessary to keep the paint or lacquer off the skin and, after use, wash with soapy water.

Most of us use epoxies in the two pack form as an adhesive. In this case there are no solvents to worry about. The question arises as to which of the two components is the more dangerous. From references I have seen it appears that both contribute to allergic dermatitis, so keep it off the skin and wash after use. In addition we can avoid using epoxies all the time. As you are well aware, we have a sophisticated range of alternative adhesives and finishes available, and anyway, it is good aeromodelling to use the most suitable adhesive for the particular application.

CLASSIFIEDS

NEW ENGINES

CS .049 Speed ABC with pipe	$150	K&B 61 RC Series 75	$135
CS .09 Speed ABC with pipe	$160.	Irvine 21R Speed ABC RE	$200
CS .09 Normal ABC	$125.	Irvine 40 RC Ring RI, RE	$150
CS .15 Speed ABC with pipe	$200	Webra 61 RC Ring, FI, RE	$150
CS .15 Speed AAC with pipe	$250	Webra 15 cc T4 4-stoke	$200
CS .21 Pylon ABC with pipe	$225	Rossi 61 RC Ring, FI, SE	$200
Picco 21 Pylon ABC, FI, RE	$125	Rossi 61 RC Ring, FI, RE	$200
Picco 21 RC ABC, FI, SE	$125	Enya .09 BB	$50
Picco 60 RC ABC, FI SE	$150	Enya 45X RC AAC FI, SE	$125
Picco 60 RC ABC, FI RE	$175	Magnum 40 PRO ABC RC	$125
Picco 80 RC ABC, FI, RE	$150	Royal 40 ABC RC	$125
K&B 3.5cc ABC, FI, RE, RC	$100	Super Tigre 21 ABC FI, SE, RC	$100
K&B 5.8 cc, ABC, FI, RE, Speed	$200	Kraft 61 RC Ring, FI, SE	$150
K&B 7.5 cc ABC FI, RE, Speed	$175	OS Gear Drive Assembly for 61	$125
K&B 7.5 cc ABC, RI RE Speed	$200		

USED ENGINES & COLLECTORS ENGINES

Thunder Jet H-1 Pulse Jet — New —	$150	HGK 15 Speed, RI, RE; VG	$150
G-Mark .061 — New —	$50	Rossi 15 Speed RI, RE' VG	$150
Hiness .09 — New —	$50	Dooling 29; G	$150
Dooling 29 — New —	$300	Super Tigre G-15, FI, SE; VG	$150
Super Tigre X40 Nelson Pylon; VG	$275	Super Tigre G20/23; G	$125
Tempest 10 cc Speed Glow; VG	$550	Taipan 2.5 Bluehead; VG	$75
OS MAX-H 60 RC; VG	$120	OS MAX-I 15; G	$50
Super Tigre G-60 Stunt; G	$100	OS PET .099; Poor	$25
OS MAX-I 35; G	$75	Webra Glo-Star 3.5; G	$100
OS 40 SR, needs venturi; VG	$125	AM 3.5 Red Head; G	$45

Contact Peter Van Meurs
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MAAA NEWS

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MODEL AERONAUTICAL ASSOCIATION OF AUSTRALIA INCORPORATED

MAAA Phone No: (03) 744 5915 **MAAA Fax No:** (03) 740 9585

Affiliations.

As at the end of June, affiliations by States and Territories were: MAAQ 1222; RCAS(NSW) 2137; NSWFFS 69; CLAS(NSW) 104; ACTAA 157; VMAA 2210; TMAA 157; SAAA 580; AWA 550; and NTMAA 66; for a total of 7252. A further 165 people were given concessional membership, with the MAAQ having 100 of these. The oncessional figures were not included in the membership figures for 1989/90.

Honours and Awards

The FAI Council, at its meeting in June, awarded G.A. (Peter) Lloyd its Gold Air Medal - its highest award - for his work for the FAI and for aviation in Australia. Peter will be known to some of you. He was FAI President in 1987 and 1988, and has attended several major model aircraft competitions in Australia, including the 1987 RC Pylon World Championships and the recent RC Aerobatics Asian Pacific-Kraft Masters. Only one Gold Air Medal may be awarded each year, and it may be withheld. On your behalf, I congratulated Peter.

The same meeting of the Council awarded the Paul Tissandier Diploma to Ian Avery, the previous secretary of RCAS(NSW), for his work over ten years as secretary and also for his work as newsletter editor. Only someone who has experience as an association secretary can truly appreciate the work Ian did over those ten years. To combine that work with compiling a monthly newsletter was to do almost superhuman work. Again on your behalf, I congratulate Ian.

Australia now has three aeromodellers who have been awarded the Tissandier Diploma. Gordon Burford, our Federal Secretary-Treasurer for over ten years, was the first in 1985. David Axon, our President, was awarded his in 1987 for his work for model aviation in Australia. The Diploma was named for Paul Tissandier who was the Secretary General of the FAI from 1919 to 1945. It is awarded to those who have served the cause of aviation in general, and sport aviation in particular, by their work, initiative, devotion or in other ways.

Fax Number

The Association now has a dedicated fax number, switched on 24 hours a day. However, the telephone bell is silenced so that I am unaware of incoming messages during the night. (Yes, I do get them; the last such from the USA was timed at 2.47 a.m.) However, if you are a member of a club, your first contact with any query should be the Secretary of your State or Territory Association. If, which is unlikely, he cannot give you an answer, he will refer your question to me. Similarly, he, or perhaps the Treasurer, can supply MAAA(Inc) badges, cloth patches, decals and ties, as well as Rule Books. Only in Victoria may I supply you with them directly. The ties are a new item and are available in blue and maroon. They carry the MAAA logo.

Errors and Omissions

The list of NSW clubs recently published left out sixteen clubs. They will be included this issue if space is available. Also, an earlier list of Queensland clubs omitted the Roma and District Club, as well as new clubs at Charters Towers and Middlemount. I can plead lack of knowledge of the last two, but for the omission I apologise. The missing details are:

Roma and District AC, Trish Jamieson,
PO Box 567, ROMA, 4455
Middlemount Aeromodellers Inc, Gary Sparks
103 Alfred Quinn Dve, MIDDLEMOUNT, 4746
Charters Towers MFC, Joseph Janecek
PO Box 491, CHARTERS TOWERS, 4820

Trish Jamieson included with her protest, cuttings from local newspapers. Actually, it is wrong to describe one item as a cutting; it took up about the whole page and gave detail not only about the club and its activities but also about aeromodelling in general and the State Association. On the same page, another local sporting club had only about 7 cm of column.

Rule Book

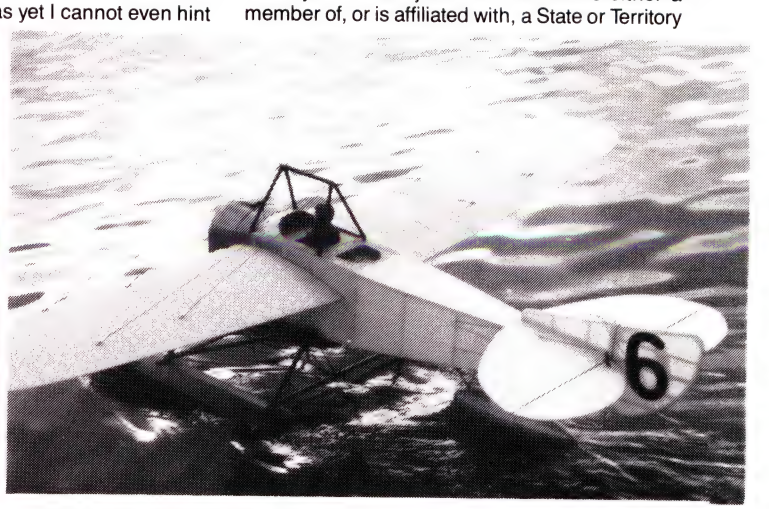
Change 5 to the Rule Book has gone for quotes for printing. As with the last two changes, owners who are not FAI Observers will be asked (nicely) to pay for it, but as yet I cannot even hint at a cost. If you do not want Change 5 and you have either paid for Change 4 or have recently purchased a book, now is the time to tell me so that I can correct the mailing list. If you did not pay for Change 4, you need do nothing; your mail list entry has not been coded for you to receive Change 5. Actually, several who did not pay for Change 3 and hence did not receive Change 4 have recently forwarded their money and have updated their copies. Still, of over 1500 copies that have been sent out, I have ownership details for a little more than half. Only sufficient copies of the latest change will be printed to cover known distribution plus anticipated sales up until 1993. Included with Change 5 is a re-write of the provisional rules for Class F3J, Thermal Gliding rules. A part of the re-write is accounted for by a change to non-sexist language. There are lots of instances of his/her, he/she and tow-persons being used, but, strangely enough, the word 'his' without 'her' still appears in places. Considering the capabilities of word processing programmes, this surprises me. Perhaps another amendment will be necessary.

MAAA[Inc] Membership.

Because I am frequently asked either about direct affiliation with the MAAA or about how to join the MAAA, I shall repeat the facts, at the risk of boring some of you. The MAAA is an Association of State and Territory Associations. Its constitution was changed to make it so a few years ago to simplify the process of incorporation. Most State and Territory Associations are are associations of clubs, again (I believe) to simplify incorporation. The individual members of clubs are recognised as affiliate members of the MAAA[Inc]. (There is provision for persons living in a state or territory which does not have a body as an MAAA members to become Associate Members directly, but because all states and territories have membership, this option is not open.) Thus, an individual may not join the MAAA directly, but must join a club which is either a member of, or is affiliated with, a State or Territory



om the AviaModelli kit of the Piper Arrow, Wayne Miller of Noarlunga Club de this Cherokee and put it onto floats. Engine is a Saito 120 and radio idance is by JR Max. Gerard Power took the pic.



Something old from Mike Linnett in the form of a 1911 Nieuport Sschneider Trophy winner. Mike blew the design up from the original plan and scratch-built the model. The flying prowess caused many a stiff neck on the day. Power is an old black head Magnum .90 four-stroke at half throttle. Engin-ear photo.

44th. NATIONAL CHAMPIONSHIPS BENDIGO & DISTRICT, VICTORIA

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GENERAL INFORMATION

VENUE

The Bendigo District which is 150km. North of Melbourne, many of the flying sites being located at Marong which is 15km. N.W. of Bendigo.

DATE

The Nationals will commence on Saturday 29th December 1990 and conclude on Saturday 5th January 1991.

ENTRIES

1. Entries will only be accepted on the official entry form, or a photo copy of same.
2. In team events, each team member must pay an entry fee. Also, every competitor must pay an administration fee.
3. A junior is a person whose 18th birthday falls on or after 1st January 1991.
4. Normal administration and entry fees will be paid for entries postmarked up to 16th November 1990.
5. Late administration and entry fees will be accepted up to 6:00p.m. 20th December 1990 at the Administration Centre.
6. If a receipt is required, please enclose a stamped, self-addressed envelope.
7. Refunds of entry fees will be made up to 16th November 1990. Thereafter no refunds are possible. The administration fee is not refundable.

RULES

The rules to be used are those as published in the M.A.A.A. Inc. Aeromodels Official Rules & Instructions 1989 (the yellow looseleaf book) as ammended at the 30th June 1990 and the V.M.A.A. Inc. published rules for unofficial events, "Safety Rules advised by the F.A.I. shall also be put into effect."
Rules for unofficial events can be obtained by sending a stamped, self-addressed envelope with your entry form, together with your request.
1989 Rules Books can be obtained through Club Secretaries.
VH numbers must be shown on aircraft, excluding scale models.
The four top placegetters will have their models processed immediately after the event. R.C. Pylon engines will be processed at this time.
In R.C. Aerobatics and Helicopter - A competitor may only enter in one class.
A single aircraft may only be flown by one competitor in any event.
Competitors who arrive late will miss out on all completed rounds of the contest.
BAD SPORTSMANSHIP will not be tolerated.

REGISTRATION DAY

The Registration Centre will be at the KANGAROO FLAT YMCA LEISURE CENTRE, Browning Street, Kangaroo Flat 3555. A location map will be sent out with Registration receipts and will also be available from the Bendigo information Centre.
Briefing at 8:00p.m., 29th December, at the Administration Centre. All contestants must attend.
All CL racing and speed, FF and RC Pylon models will be processed at the Administration Centre.
Only those radio frequencies approved by the MAAA will be allowed.
Transmitter checks will be performed on registration day at the Administration Centre. **All** transmitters must be checked. Those who have no valid stickers on their radio equipment will have to pay for equipment checking at the current rate. A service for this purpose will be provided close to the Registration Centre.
Current FAI licences must be shown on registration day.
Entrants in Mammoth Scale **must** present permits to fly that aircraft.

NOISE LEVELS

The Control Line Bitumen Site is within the confines of the Bendigo City boundary and will be the subject to the following times of operation:.

Week days 9am - 6pm.
Weekend 10:30 am - 6pm.

SPECIAL REQUIREMENTS

Please indicate on the entry form your requirement for the special items listed below.

1. Special Limited Edition Port Crock embossed with the Nationals logo and the Bendigo History.
2. Special Edition Glasses with Nationals logo and rim in GOLD LEAF.
3. New Years Eve Barbecue which includes entertainment for $10 per person.
4. Presentation Dinner which includes a four course meal plus cheese and greens and refreshments for $30 per head.
5. Please indicate if you require child minding facilities for the duration of the Presentation Dinner.

WELCOME TO BENDIGO

The Bendigo Aeromodellers and the organising committee are working very hard to ensure that these Nationals run smoothly and where possible everyones needs are catered for, and are looking forward to greeting you on registration day. The Bendigo area offers a journey into Australia's heritage. Come and see a Chinese Dragon, ride a talking tram, watch Bendigo pottery being made, burn an incense stick at the Chinese Joss House, see magnificent historic buildings, smell the eucalyptus oil being distilled or enjoy an unrivalled array of recreational persuits - you'll find a warm welcome and create memories that will last a life time. Locality maps and further information will be available at the Registration Centre.

ORGANISING ASSOCIATION: VICTORIAN MODEL AERONAUTICAL ASSOCIATION

MODEL AERONAUTICAL ASSOCIATION OF AUSTRALIA

44th. NATIONAL CHAMPIONSHIPS BENDIGO & DISTRICT, VICTORIA

ORGANISING ASSOCIATION: VICTORIAN MODEL AERONAUTICAL ASSOCIATION

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OFFICIAL ENTRY FORM
44th M.A.A.A. NATIONAL CHAMPIONSHIPS

OFFICE USE ONLY

ENTRY No.

SURNAME: _____ INITIALS: _____ FAI No: _____
PLEASE PRINT PLEASE PRINT PLEASE PRINT

ADDRESS: _____

TOWN/CITY: _____

PHONE Nos: STD CODE: _____ HOME No: _____ WORK No: _____

TEAM MEMBER - Control Line & Pylon:

EVENT: TEAM MEMBER NAME: FAI No:

ADMINISTRATION FEE: _____ $20.00

EVENT FEE ($5.00 per EVENT SNR.) ($2.00 per EVENT JNR.)

No. of EVENTS ENTERED: _____ x$5.00 = _____ $.

No. of EVENTS ENTERED (Jnr.): _____ x$2.00 = _____ $.

No. of DINNER TICKETS (Single; Drinks incl.): _____ x$30.00 = _____ $.

EXTRAS (Over & Above Goodie Bag):

NATS METAL BADGES - No.: _____ x$5.00 = _____ $.

NATS TRANSFERS - No.: _____ x$2.00 = _____ $.

NATS SOUVENIR PORT (Stone Decanter) ☆ - No.: x$20 = _____ $.

CLOTH WOVEN BADGES ☆ - No.: _____ x$4.00 = _____ $.

SPECIAL EDITION GLASSES - No.: _____ x$4.00 each = _____ $.

NEW YEAR'S EVE B.B.Q. (Including Entertainment)
No.: _____ x$10.00 / Single = _____ $.

SPECIAL NATS BADGE (1 only) @ $7.00 = _____ $.

TOTAL COST (Including Administration Fee): _____ $.

PLEASE FIND ENCLOSED CHEQUE / POSTAL NOTE: PAYABLE TO "44th NATIONALS"

☆ **PLEASE NOTE:** CLOTH WOVEN BADGES, SPECIAL EDITION BADGE, GLASSES, NATS CAPS & PORT ARE **NOT** INCLUDED IN GOODIE BAG.

CHILD MINDING REQUIRED FOR _____ No. OF CHILDREN FOR PRESENTATION DINNER

COMPETITOR / OFFICIAL STATEMENT OF AGREEMENT

I agree to abide by all rules as laid down by the Association and as stated in the Official Rules Book or Special Rules as designated. I agree to compete in a sportsman-like manner and will also make myself available to assist with the running of the National Championships in any way I am asked.

Signed _____

CLOSING DATE FOR ENTRIES: Received by Registrar last mail 16-11-90. Late entries will be accepted until 1800 hours on Registration Day. *PENALTY* - DOUBLE ENTRY FEES.

OFFICE USE ONLY
ENTRY REGISTERED:
FEE CORRECT:
QUERIES:

EVENTS:

INDICATE ENTRY
BY AN X IN EACH APPROPRIATE BOX.

CONTROL LINE

1. FAI SPEED ❑
2. FAI AEROBATICS ❑
3. FAI COMBAT ❑
4. FAI TEAM RACE ❑
5. SCALE ❑
6. COMBINED SPEED INCLUDING JET ❑
7. 1/2 A TEAM RACE ❑
8. GOODYEAR ❑
9. MINI GOODYEAR ❑
10. 2.5 CC RAT RACE ❑
11. OPEN RAT RACE ❑
12. VINTAGE STUNT ❑
13. VINTAGE TEAM RACE ❑
14. OPEN COMBAT ❑
15. BENDIX ❑
16. JNR. COMBAT ❑
17. JNR. 2.5 CC RAT RACE ❑
18. JNR. AEROBATICS ❑

FREE FLIGHT

19. F1A GLIDER ❑
20. F1B WAKEFIELD ❑
21. F1C POWER ❑
22. F1H GLIDER ❑
23. F1G COUPE D'HIVER ❑
24. F1J 1/2 A POWER ❑
25. OPEN POWER ❑
26. OPEN RUBBER ❑
27. HAND LAUNCH GLIDER ❑
28. DAY SCRAMBLE ❑
29. NIGHT SCRAMBLE ❑
30. FREE FLIGHT SCALE ❑
31. VINTAGE RUBBER ❑
32. VINTAGE POWER ❑
33. VINTAGE GLIDER ❑
34. UNORTHODOX (No Entry Fee) ❑
35. JNR. OPEN RUBBER ❑
36. JNR H.L.G. ❑
37. JNR. OPEN GLIDER ❑

FF INDOOR

38. PEANUT SCALE ❑
39. INDOOR H.L.G. ❑
40. EZB ❑
41. F1D MICROFILM ❑
42. HANGAR RAT ❑

** RADIO CONTROL*

43. OLD TIMER DURATION ❑
44. OLD TIMER TEXACO ❑
45. OLD TIMER 2 CC ❑
46. OLD TIMER 1/2 A ❑
47. VINTAGE GLIDER ❑
48. F3B MULTI TASK GLIDER ❑
49. THERMAL GLIDER ❑
50. F3E ELECTRIC GLIDER ❑
51. 7 CELL ELECTRIC ❑
52. F4C SCALE ❑
53. STAND OFF SCALE ❑
54. MAMMOTH SCALE ❑
55. AEROBATICS MASTERS ❑
56. AEROBATICS EXPERT ❑
57. AEROBATICS ADVANCED ❑
58. AEROBATICS SPORT ❑
59. PYLON FAI ❑
60. PYLON 1/4 MIDGET ❑
61. PYLON 1/2 A ❑
62. HELICOPTER F3C ❑
63. H'COPTER INT'MEDIATE ❑
64. H'COPTER NOVICE ❑
65. SCALE GLIDER ❑
66. JNR. O T TEXACO ❑
67. JNR. O T 1/2 A ❑
68. JNR. THERMAL GLIDER ❑

* Please supply radio frequency for each event entered.

NOTE: **Post this entry together with remittance to the Registrar: G.M. WILSON, P.O. BOX 298, SEAFORD, VICTORIA, 3198.**

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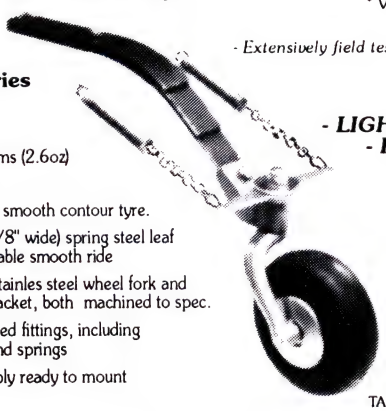
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ACTUAL PHOTO OF TA 1000 ASSEMBLY

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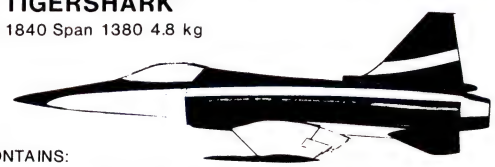
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PROGRAM FOR THE 44th NATIONAL CHAMPIONSHIPS

SATURDAY 29 DECEMBER 1990

REGISTRATION, PROCESSING
TRANSMITTER CHECKING, CONTESTANTS BRIEFING.
1/2 A PYLON (Depends on No of entries).
STUNT CLINIC (Starts Friday).

	RADIO CONTROL	CONTROL LINE	FREE FLIGHT
SUNDAY 30th December 1990	1/2 A Pylon 1/4 Midget Pylon Aerobatics Thermal Glider Jnr. Thermal Glider Helicopter F4C & SOS Static Judging	Stunt Clinic Aerobatic Judges Seminar FAI Speed Open Combat	F1C Open Rubber Jnr. Rubber Peanut Scale Indoor HLG
MONDAY 31st December 1990	1/4 Midget Pylon FAI Pylon Aerobatics Thermal Glider Helicopter Mammoth Scale Static Judging	FAI Team Race FAI Aerobatics Concours D'Elegance (Aerobatic Models) Jnr. Aerobatics Static Judging C.L. Scale & Vintage Stunt	F1B Open Power Indoor Practice Static Judging F.F. Scale
TUESDAY 1st January 1991	FAI Pylon Aerobatics Thermal Glider	2.5 cc Rat Race Snr. & Jnr. FAI Aerobatics Jnr. Aerobatics C.L. Scale	F1A Jnr. Glider F1D EZY BEE
WEDNESDAY 2nd January 1991	F4C SOS Old Timer Duration F3B	Good Year Mini Goodyear Vintage Stunt	F1H HLG Jnr. HLG Night Scramble
THURSDAY 3rd January 1991	F4C SOS Old Timer Texaco Jnr. Texaco F3B	Combined Speed FAI Aerobatics Jnr. Aerobatics FAI Combat Jnr. Combat	F1G Day Scramble
FRIDAY 4th January 1991	Mammoth Scale Old Timer 2 cc. Old Timer 1/2 A F3E 7 Cell Electric	1/2 A Team Race Open Rat Race FAI Aerobatics Jnr. Aerobatics	F1J F.F. Scale Hangar Rat
SATURDAY 5th January 1991	Scale Glider Vintage Glider	Bendix Vintage Team Race	Vintage Power Vintage Rubber Vintage Glider Unorthodox

PRESENTATION DINNER



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Association. It is permitted for an individual to join a club outside his State or Territory, but clubs are required to join or affiliate with the appropriate State or Territory Association. I know that these membership requirements disadvantage some potential members who have access to their own flying fields, however, it ensures that the majority of members have access to a place where they can fly models safely. The MAAA, through the states and territories, is working to implement a basic standard ofinstruction as well as to introduce graded standards of proficiency.

Regarding proficiency, I notice that the UK controlling body has introduced certificates of competency of different levels and, I believe, a certain level must be achieved before a modeller may enter the National Championships. We have no restriction on entries to Nationals, although, to encourage participation by the less expert, there are graded levels for RC aerobatics.

World Championships

Australia will be represented at only two World Championships in 1990. Peter Pine, Hans Sommerauer and Michael Farren, with Roy Farren as Team Manager, will compete in the RC Electric (Class F3E) Championships in Austria. Roshan Samuel will fly in FF glider (Class F1A) in the Junior World Champs in Yugoslavia. I wish them all success. Roshan has also qualified for the F1A team to compete in the FF World Champs next year. We are not, or will not be, represented at the Indoor FF, Control Line or Scale World Championships this year. The main reason is cost. Each of our team members must pay up to about $6000 to attend, for air fares, accommodation, meals, car hire and maybe freight on models. Several countries pay either all or a major part of the cost for their representatives at World Championships. Each of you has subsidised our representatives to the World Champs this year by about $0.09. To fully pay the costs of a full team every year would cost each of you about $10.00 a year, which,I agree, is excessive. However, would you agree to pay $2.00 a year to assist World Champs team members? This is the figure that the Canadians pay. I know that we have world class meodellers in several classes, but they, like most of us, cannot afford the massive financial sacrifice necessary to compete in a world championships. The result is that they do not bother. If you knew you would be helped financially to compete in a World Championship would you try that little bit harder? *C'mon Aussies! Be in it.*



At Darwin's East Point flying field, John Ellis and Mark Smith with their Cap 21s. John's has an OS 61 FSR, 12 x 8 prop and Hatori heli muffler. Mark's has OS 61 VF, 12 x 6 prop and J-Tec muffler. Both are fast and aerobatic. Mark conducts the business at North Australian Models & Hobbies. Photo by the Editor.

Although David Axon is doing his best to convince the Australian Sports Commission (ASC) that model aviation should receive grants for our World Champs competitors, I doubt that he will be successful. My doubt is re-inforced by an article in the Gliding column in the July issue of 'Aircraft'. It reports that the Gliding Federation obtained a grant of $2,000 from the ASC for the world's second ranked open class glider pilot (Ingo Renner) to train for and attend the next gliding world chanpionships in the USA, but that the seventh ranked pilot (Michael Giles) was not given one because gliding did not have a high enough public profile to warrant the funding of a competitor ranked **only** seventh (my emphasis). The message is that we cannot depend on grants from a government intent on helping mainly the elite and high profile sports (and who can blame it). As it is now, if model aviation had a high enough profile, only one Australian aeromodeller would have any chance of a grant, and on results of trials to date it seems that he cannot qualify for our team in 1991.

I should point out that the MAAA[Inc] received $1,000 from the ASC through the Australian Sports Aviation Confederation [Inc] for travel to an overseas conference (the CIAM meeting last April), but this was part of a blanket grant of $10,000 to ASAC[Inc] for the purpose. For that we thank the ASC and ASAC[Inc].

Records

Three new Australian contest category records have recently be ratified, as follows:

Goodyear 2.5 cc 200 laps
R. Fitzgerald & T. Fitzgerald 14 April 1990
7 minutes 42.18 seconds

RC Pylon FAI Class F3D
R. Phelan 10 June 1990
1 minute 15.7 seconds

RC Pylon ½A
R. Phelan 11 June 1990
1 minute 21.8 seconds

The last record was set over the larger (Quarter Midget) course. The previous record, held by B. Steele and set over the shorter course, is now retired.

I have had several queries over the last few months about records and record attempts, the most recent from Broken Hill. An attempt on RC Duration was made in the Geelong area but was unsuccessful. I also had a query about the absolute records maintained for duration, distance, altitude and speed; in particular, could a control line model be used to set the duration and distance records? As far as I can determine, CL records for duration and distance were done away with in the 1940s as being meaningless. The current Australian absolute duration record of 28 hours and 28 seconds is held by the late Brian Laging, and was set by a slope soaring glider. I somehow doubt if a CL model could exceed that time, but if the MAAA Council were to sanction it, there is no reason why it should not be tried. As for distance, the record of 118 km is held by Col Taylor, and dates back to 1977. This is the category that several RC flyers are looking at. I doubt if a CL claim would be recognised because there is an implication that it is a straight line distance. Ray Pike has an RC closed circuit distance record of 150 km, but this is not recognised as the absolute distance record. The absolute speed record of 322 kph is held by Andy Kerr with a CL model. Because any record over 300 kph must now be timed electronically without manual intervenbtion, it is unlikely that this will be easily broken, although so timing a CL model would be simple compared with an RC model. *See Aeromodelling Digest 1990 for details of all records. For ordering details see advertisement elsewhere in this issue.*

Judges School

Ford Lloyd of the VMAA has just conducted judges schools in Victoria and NSW for scale competition. Some of those who attended are well known competitors, yet I believe that even they learned things that they did not know or had forgotten. The manoeuvres to be flown are described in the Rule Book, and possible errors listed. Ford is one of the best salesmen we have for Rule Books. It is surprising how many flyers think that they know what is required and so do not refer to the book, with a consequent effect on their scores. It should not be surprising how important the set-up and start of a manoeuvre is. After watching many procedure turns I can forecast the resulting errors if the entry into the



Concentration of the youngest pilot at the National Rally. Six year old Andrew Stevenson is the 3rd generation RC pilot in the Stevenson family. Andrew had a 15 minute thermal flight at Wangaratta.

first 90 degreee turn is delayed. Most flyers do not start the turn until they are opposite the judges, and invariably the turn is only 45 or perhaps 60 degrees. To return on a path in front of the judges the rate of turn is progressively increased, a further cause for downgrading.

Testing Stations

The following is a list of approved testing stations.

MAAA[Inc]
AUTHORISED TESTING STATIONS
Queensland

Southside Hobby Centre,
216 Logan Rd., BURANDA, 4102
S.J. Smith,
45 Blackwood Rd., MITCHELTON, 4053
V. Savaris, Northgate Rd., NORTHGATE, 4013
L. Tebbit, 48 Geisel St., DALBY, 4405
Morgan Communications (G. Morgan),
4 Elizabeth St., MT. ISA, 4825
Waterson Communications (D. Waterson),
10 Grendon St., NTH. MACKAY, 4740
Olbis Industries (M. Pietersen),
405 Bayswater Rd., GARBUTT, 4814
G. Kempster, RAAF Base, AMBERLEY, 4306

New South Wales

A. Bird, 8 Genoa Place, TASCOTT, 2250
Jordal Hobbys,
397 Anzac Pde., KINGSFORD, 2032
Jordal Hobbys,
Shop 1, 9-11 St. Johns Ave., GORDON, 2072
Jordal Hobbys,
1/31 Forge St., BLACKTOWN, 2148
Kellett's Hobbies, Shop 12 The Mall,
317 Macquaries St., LIVERPOOL, 2170
Silvertone Electronics,
Unit 6/2 Schofield St., RIVERWOOD, 2210
V. Jones,
5 Cooinda Place, BAULKHAM HILLS, 2153
R. Stapleton, 37 McCall Ave., CAMDEN, 2570
T. Jacobs, 10 Gallard St., RYDE, 2112
G. Connors, 93 Sherwood Rd., KEMPSEY, 2440
Dowcom Communications (G. Dowse),
101A Swan St., WOLLONGONG, 2500

Victoria

Fliteline Distributors (R. Keohler),
Pilgrim Court, RINGWOOD, 3134
T. Wesley,
22 Charlton St., NTH. SPRINGVALE, 3171
Kraft Systems, 59 Ryrie St., GEELONG, 3220
Orchards Hobbies (A. Laurie),
85A Hoffmans Rd., NIDDRIE, 3042
Micro Electronics (E. Beilby),
20 Glyn St., GEELONG,3216
RK's Communication (M. Weaver),
Hamilton Rd., HORSHAM, 3400
Tallangatta Electronic Services (B. Ritchie),
6 Yamba Rd., TALLANGATTA, 3700
Weeks Radio, "Acheron Downs",
Maroondah Hwy., ALEXANDRA, 3714

South Australia

D. Brough, 130 Adams Rd., TROTT PARK, 5158
W.M. Kent,
26 Thorndon Cresc., PARADISE, 5075

Northern Territory

NARES (M. Smith),
61 Dalwood Cresc., SANDERSON, 0812

RCAS(NSW) (Clubs omitted last issue)

CLUB	ADDRESS
Cowra Model Aircraft Club	"Ferndale", KOORAWATHA, 2807
Cronulla Model Aero Club	9 Chipilly Avenue, ENGADINE, 2233
Cumberland Radio Control Modellers Club	65 Denman Road, GEORGES HALL, 2198
Dubbo Radio Control Model Aircraft Club	68 Oxley Circle, DUBBO 2830
Eurobodalla Model Aero Club	11 Anderson Street, MORUYA, 2537
Forster Tuncurry Model Aero Club	c/o 14 Waterview Street, FORSTER, 2428
Freemans Reach Radio Controlled Society	32 Sluma Street DENISTONE, 2114
Glen Innes R.C. Aircraft Society	3 Young Street, GLEN INNES, 2370
Goulburn Society of Aeromodellers	2 Bellevue Street, GOULBURN, 2580
Griffith Model Aero Glub	PO Box 1003, GRIFFITH, 2680
Gunnedah Model Aircraft Club	'Sharinor' River Rd., COONABARABRAN, 2357
Heathcote Soaring League	PO Box 214, SUTHERLAND, 2232
Hills Aero Modellers Society	51 Barnetts Road, BEROWRA HEIGHTS, 2082
Illawarra Model Aero Club	6 Regency Crescent, BERKELEY, 2506
Inverell Model Aircraft Club	Post Office Residence, ELSMORE, 2370
Kempsey Model Aircraft Club	PO Box 295, KEMPSEY, 2440
Kiama Model Aircraft Flyers	17 Kalang Road, KIAMA, 2533

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16 x 10	$22.50	19 x 11	$33.50
18 x 6 (or 8)	$23.50	20 x 11	$36.50
18 x 10	$23.50		
20 x 10	$26.75		
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5 inch: Spitfire Mk 1 to 5 & Mk 6 to 9, Seafury 77 inch

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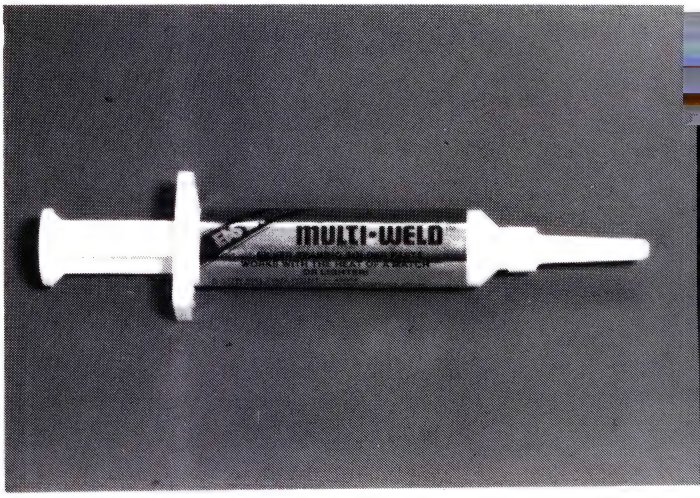
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TRADE NOTES

The Kingsford's advert about In Flight Photography in the last issue was not as impressive as the video they have made. The quality of the tape is good when considering that footage was taken in some poor light conditions, which actually make the photography much more exciting. Some of the shots show the pilots to be very daring! The video tells how you can do it yourself. It's available from Adrian Kingsford, 12 Toru Street, Mapua, Nelson, New Zealand, for AU$50 airmail.



Now available from Kraft Systems, an on-field charger for Rx and Tx batteries. Power source is a 12 Volt accumulator connected with alligator clips, and the charging jacks fit Futaba radio, although other connectors may be used. Charging currents are 450 mA at 12 V for the Tx and 500 mA at 6 V for the Rx. This should enable flat batteries to be charged in one hour, which would be a bit too fast for most radios, but would provide a good top-up on the field for an extended flying session.



The easy way to soldering is with DuBro MultiWeld. Just squeeze some pas on to the job and apply the hot iron to the job (not the paste) till the solc runs out of the flux (ignore the smoke) and then spread the solder with tl iron. Takes a little longer on thick piano wire undercarriages. DuBro is import by Kraft. Your hobby shop should have it for you.

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Something else that ducted fans are good for: testing new designs. This cou be a Stealth fighter, but we may never know! All black model is in th company of some oldies. At Fort Worth.

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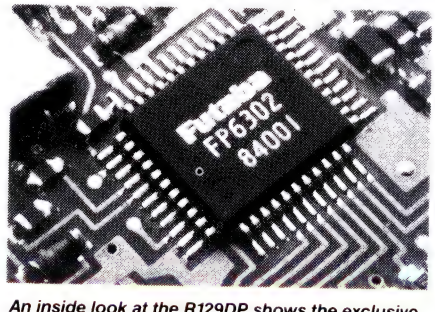
S148 Servos.....**$38.00**

S3001 Servos, ballraced.....**$59.00**

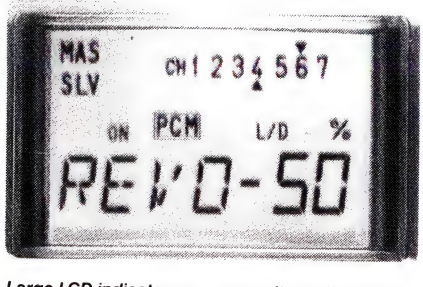
Harness for above with charge leads.....**$16.00**

NARROW MINDED 1991 RECEIVERS

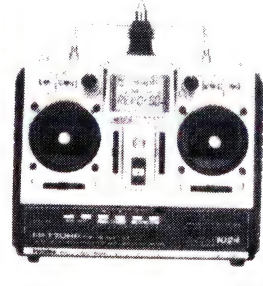
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This is the large version of the Opal model of the microlight designed by the late Scott Winton. The Opal kits, in 3 sizes, are manufactured by Scott's elder brother, Dean, in Doyalson on the NSW Central Coast. Scott flew the Opal to 4 world and national records in just 4 days in March 1989, but was killed when the craft disintegrated on his return to Doyalson for Mothers' Day last year. The brothers shared a deep and extensive knowledge of aeronautics, and the Opal kits are, like the original, fast, high performance models for power flying or slope soaring. The fuselages are GRP. Controls, connections and covering are supplied. The sizes are 1.1 metres, 1.4 metres and ¼ scale 1.65 metres. They are for experienced modellers, and building time is short; about 8 hours for the smallest. Readers are already testifying to these excellent models.

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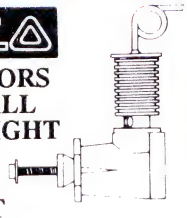
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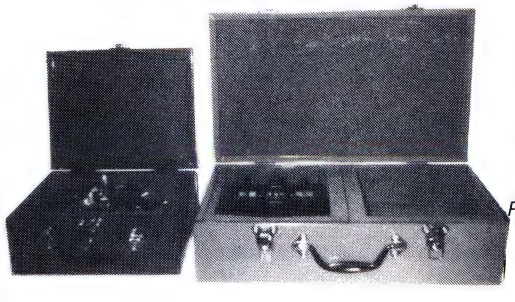


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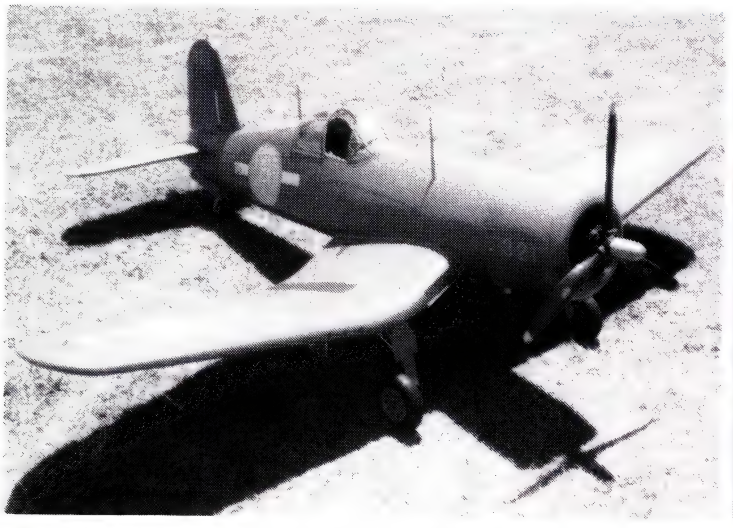
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NEW ZEALAND NOTES



F4U-1 Corsair by Gerry Bolton from the 1/6 scale Byron kit. Uses a 70 cc Sachs-Dolmer engine. Has all controls plus retracts, flaps and canopy from 7 function Kraft radio. Coverite and enamel finish brings weight up to 25 lb or 11.36 kg. Cooksey photo. Wonder how it sounds.



F1A Glider winner, Malcolm Sexton of Taumaranui, NZ. Malcolm placed 8th at the 1989 FF World Champs, and continued his success back in New Zealand. He was a member of the 'Argies 89' team, with Ian Weston and Bill McGarvey, which won the team prize at the Pacific Champs. Robinson photo.



An early Armstrong Whitworth 15 air liner by Colin Duthie to 1/10 scale, giving a span of 9 ft. Model has four OS 15 2-stroke, weighs 12½ lb and is all white with blue lettering. What a beauty! Pic by Bill Cooksey.





Bill McGarvey with Wake-Up kit model for F1B from Champion Model Products in the USA. "Easy to build and has very good performance," says photographer Ackery. Note hi-tech fuse DT!

Pacific Free Flight Championships Plans Book. Drawings from all the competitors and photos of the event. Enquiries to George Curtis, 31 Glamorgan Drive, Torbay, Auckland, New Zealand.

FREE FLIGHT TOPICS

by Merv Buckmaster

CUP IN THE POST

Postal contests usually bring forth stories of good weather and bad weather, as well as a few scores. The AIRBORNE Coupe d'Hiver postal provides for flights to be made on any day in June so that good weather may be chosen. In spite of that proviso, this year's results included fairly good weather but poor attendance in NSW; a fine, very windy day but good attendance in Queensland, and the scribe's lone attempt in the very soggy Garden state.

I actually took my model out of its box at the start of the month, made a new prop and checked the motors by mid-month, but left the flying till the very last day when the rain stopped between 0830 and 0900 hours! The flights were very consistent and very short! I must make a new, big Hatcheck style prop, although I noticed that he was using 14 strands of 1/8 FAI rubber, which would be only a couple of inches long for 10 grams of it. His motors are actually 25 grams, so I'm not sure why he calls it a Coupe! The prop is nominally 24 x 26, helical pitch set at + 3.5°, making it 24 x 30.5.

Whatever the rationale may be, try it; have fun and join in the Postal Contest next year. Each flyer receives a special certificate for participating. This year Jim Christie maxed out, young Ben Lewis came close, Allen Thomas lost his model in a thermal and Roshan Samuel was at the opposite end of the list to that of his AFFS win. No doubt he's working towards his flying in the World Champs.

Results

Jim Christie	600 + 180 + 159
Ben Lewis	544
Pieter de Visser	461
John Lewis	458
Col Somers	421
Vic Stewart	287
George Baynes	249
Brian Taylor	189
Allen Thomas	179
Merv Buckmaster	166
Roshan Samuel	78



Peanut scale Wright Flyer, a twin pusher canard biplane, as mentioned in the Electric column. Layout earns lots of points in competition. Model and photo by Phil Stevenson.

S.A. FREE FLIGHT CHAMPIONSHIPS
Bordertown, October 6th to 8th 1990

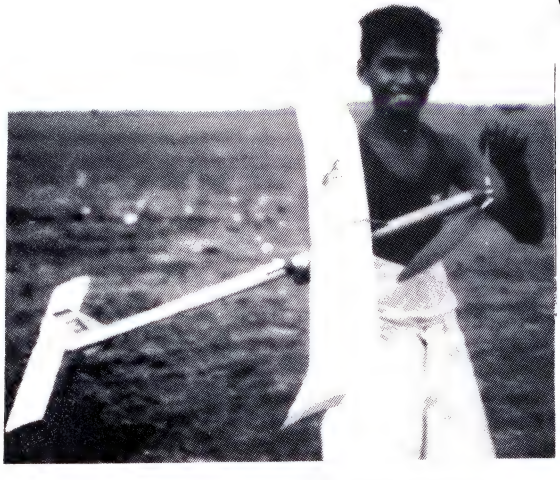
Sat. 6th: 1300-1700	F1A; 4 x 1 hr rounds	1200-1730	Combined Open; 3 flights, no rounds
	F1B; 4 x 1 hr rounds		Combined Vintage; 3 flights, no rounds
	F1C; 4 x 1 hr rounds		(1954 cut-off)
Sun. 7th: 0900-1200	F1A; 3 x 1 hr rounds	Mon. 8th: 0900-1200	F1H; 5 flights, no rnds
	F1B; 3 x 1 hr rounds	1100-1200	Hand Launch Glider (best 3 from 6)
	F1C; 3 x 1 hr rounds		

FREE VICTORIAN FLIGHT VFFS SOCIETY

NEW MEMBERS WELCOME!

SEPT 9	COMBINED FAI
OCT 7	INDOOR EZ-B, HANGAR RAT & HLG (at Sunshine)
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DEC 16	INDOOR EZ-B, HANGAR RAT, HLG & PEANUT (at Sunshine)

V.F.F.S. MEETINGS
will be held at Sport Aircraft Association
265 Queens Parade, Clifton Hill, at 8.00 pm
on the 1st Thursday of each month.
Flying Meetings are at Boundary Road, Brooklyn
(Melway reference: page 39, D9).



Roshan Samuel at the AFFC, 1990, with C d'H ready for fly-off, with F1B winner, Richard Blackam.

THE AUSTRALIAN FREE FLIGHT TRIALS

Canowindra, June 1990, for the Yugoslavia World Championships 1991

Results — 14 Rounds

F1A (8 flyers)		F1B (10 flyers)		F1C (6 flyers)	
1. R. Samuel (Jnr)	2492	1. R. Blackam	2528	1. J. Fletcher	2625
2. P. de Visser	2355	2. G. Baynes	2454	2. D. Thomas	2549
3. V. Morgan	2223	3. B. Chinchella	2355	3. R. Summersby	2437
4. D. Bailey	2114	4. A. Edwards	2312	4. W. East	894
		(Note: Rounds 5 & 6 were 3½ minute rounds.)		(Note: Rounds 5 & 6 were 4 minute rounds.)	

Teams: to be confirmed

F1A:
1. Roshan Samuel (Jnr)
2. Pieter de Visser
3. Vin Morgan
Reserve - Dave Bailey

F1B:
1. Richard Blackam
2. George Baynes
3. Bruno Chinchella
Reserve - Allan Edwards

F1C:
1. Jon Fletcher
2. Dave Thomas
3. Roy Summersby
Reserve - Bill East

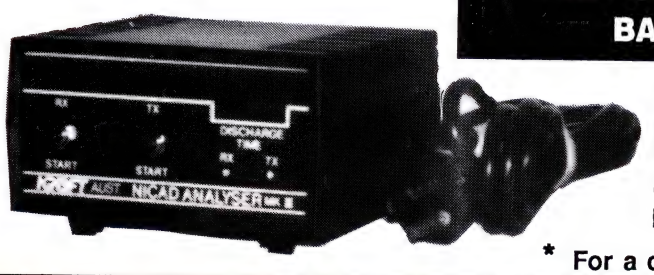
Roshan beat Richard, with photographer, Dave Ackery, picking the air for him. Roshan also won F1A at the FF team trials in June, and hopes to go to the World Championships.

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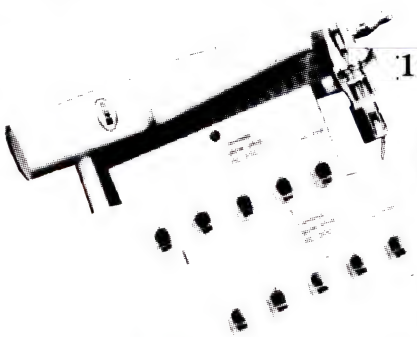
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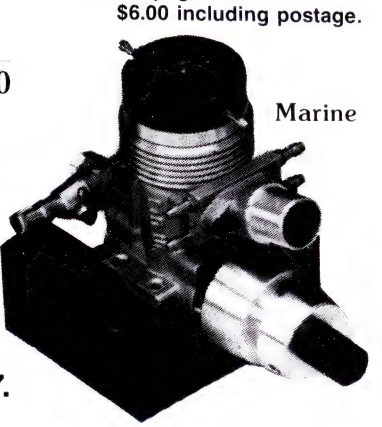
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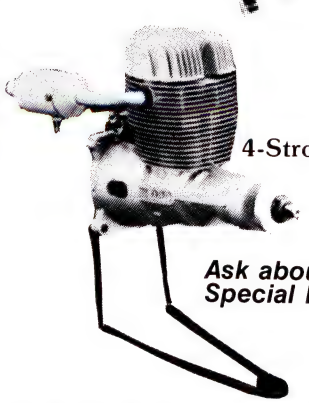
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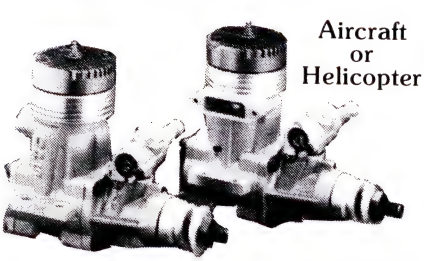
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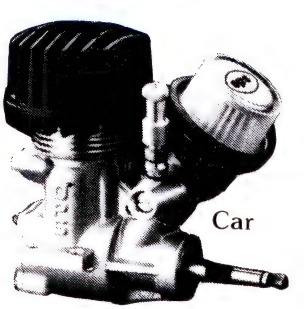


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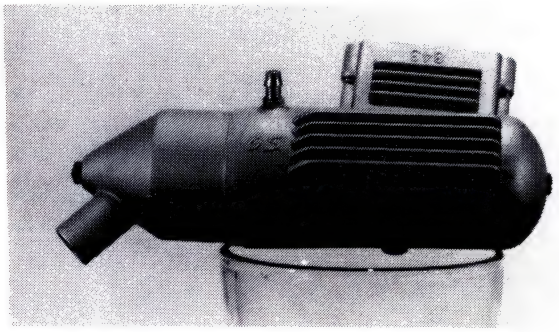
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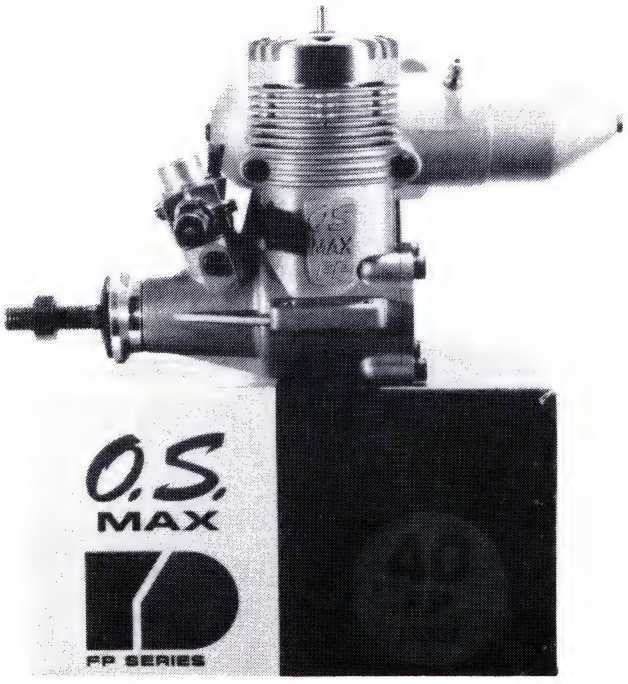
Car

Engine Review

OS .40 FP-ABC



OS mufflers are designed to be strong. Also help to reduce noise, but other noise control measures should be considered by the user as well.



New series OS 40 FP is a good choice for casual flying, and highly recommended for new modellers.

SPECIFICATIONS	
Displacement:	6.49 cc (.3963 cu in)
Bore:	21.2 mm (.8346 in)
Stroke:	18.4 mm (.7244 in)
Weight (no muffler):	248 g (8.75 oz)
Power potential:	1.0 BHP @ 15,000 rpm
RPM potential:	16,000 rpm
Fuel recommended:	methanol, castor or synthetic & nitro
Propeller range (sport):	10 x 6 to 11 x 6
Piston and liner:	aluminium plated brass; no ring

Outline

Copying is the ultimate form of flattery, so Mr. OS must be beaming with pride. How many manufacturers have used the OS as the pattern for their products? Not just a copy, mind you; a facsimile so close to the master that, in many cases, the parts are interchangeable. The modeller is therefore faced with a dilemma. Which one should he buy, and why? Price is no guide, as there is little, if any, difference. It comes down to quality, reputation and spares back-up. My suggestion is to ask your model shop dealer about the availability of spares and service, and observe what the modellers at the field are using with satisfaction. If an engine, or any product for that matter, does not satisfy the fickle modelling fields, it is no problem to be told the reasons why. Anyway, we have before us an OS engine, so let us see what is in its make-up.

Castings

To me, this is the first area of success or so-so. It takes a lot of experience and knowledge to pour molten metal into a mold and cast a presentable product. This is particularly so with the alloys of aluminium. Among the many little bugbears of this operation with any metal, aluminium is particularly prone to contamination, gas in the melt and temperature fluctuations. Any slip in the preparation for the job is readily seen in the finished product as pin-holes in the surface, slumping of sharp lines, incomplete areas and blowholes that generally show up during **final** machining (Murphy's Law). If you are looking for any of these problems in the OS casting work you are wasting your time. I have some of the very first OS engines, and the casting work on them is top quality by today's standards. Their present work is magnificent.

The main body casting, comprising crankcase, front housing, barrel and manifolds, is an excellent bit of design, casting and machining. All fuel and exhaust ways are cast in with such accuracy and quality that they require no final machining. Those sections of the casting that are machined are bright and blemish-free. The crankshaft bearing is bronze, and it appears to me that it has been set in place before the casting (in the mold) and is keyed to the maincase by a protrusion of the inlet manifold. If you look down the bearing you can see aluminium showing through the bearing in this area. A fine oilway is cut into the bronze bearing for about ¾ of its length. On the top of the case you will notice a very small roll pin that locates the liner position. This serves two purposes. The obvious first is to ensure that the cut-outs in the line are in the right position, which leads to the second, and that is to maintain the position of the gudgeon pin between the cut-outs. If this was not done, the pin could bridge two ports and change the timing, or it could move out and jam into a port opening, with results too horrible to consider.

The head is a casting with a deep insert into the barrel for sealing, and this is ensured by a soft aluminium gasket on the top of the liner.

The squish band is 4 mm wide and angled towards the combustion bowl. The backplate is the usual 4 bolt style, and the cast-in flat on the insert section goes upwards (in case you forgot). I have had quite a number of mufflers similar to the OS brought to my workshop for repair lately. All had the same problem; the manifold section had broken away from the body during flying. There was no evidence of crash damage, but the cause can be seen. The manifold section butts squarely up to the main body, and that is a weak point. On the OS muffler you will see a radius where the manifold joins the body, and a reinforcing rib at each end under the bolt lug. I have never seen one of these mufflers break in this area, even when crash damaged. The rear cone of the muffler has a side outlet spout, and this can be rotated to suit your needs. The muffler can be separated into main body and rear cone by undoing the centre bolt. This will allow you to fit an OS mute or other sound lessening device (OS supply Tatone Snufflers fitted if desired) for use in noise sensitive area. The muffler is attached by two bolts through the engine manifold.

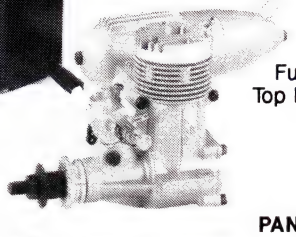
Piston and Liner

The first FP series engines were fitted with iron pistons and steel liners, both of which are excellent for the purpose but reasonably labour intensive to obtain the desired finish. The one disadvantage of an iron piston in larger capacity engines is its weight. A heavy piston robs an engine of power, as much of it is absorbed in lifting the piston up from bottom dead centre. OS have solved both problems with their new aluminium piston and brass liner. The aluminium piston is quite simple to make and obtain a high grade finish on the working surfaces. The brass liner is also simple to machine and obtain a good surface with simple tools. Ports are easily cut in, and distortion is almosy non-existent. The expansion rate of each metal complements the other, and all is (almost) a garden of roses. Brass is a rather efficient bearing metal, but not with an aluminium piston racing up and down like a rat up a drainpipe with turps on its ... er ... tail. Also, aluminium has a nasty habit of locking into brass and many an unwary engineer has been caught with a permanent joint where none was intended. The method of solving both problems is to plate the brass with chrome or nickel. The chrome plating is not the shiny type we see on objects for decorative finish, but a hard chrome, and it has excellent wear qualities. Nickel does not seem to be as popular at this stage, except in the OS factory where their wizards or witch doctors have come up with some secret process whereby the nickel is not really a plating but is homogenous with (part of) the outer surface of the brass. Veeerry interesting! No chance of peeling (de-

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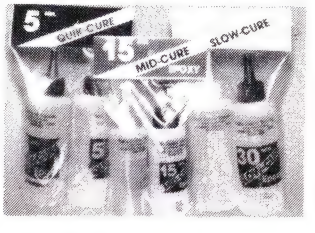
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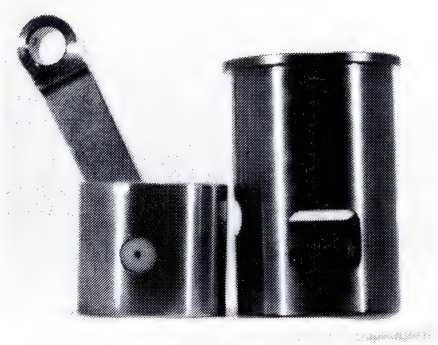
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Design, materials and porting for moderate, reliable performance and long life. Piston and conrod are different aluminium alloys and liner is nickel-treated brass; all OS secrets.

laminating), and absolute accuracy according to the original finish of the component being plated. I don't have precise details of how this process works (probably a certain amount of industrial secrecy involved), but I have looked into a similar process, where machine tools (taps, drills, cutters and so on) are plated by some form of electronic inducement or bombardment that does not increase the size of the job but increases the working life by 500%. Apparently the OS liner plating process is similar, which could explain the longevity of that part of the engine.

The connnecting rod, conrod to friends, is the now expected from OS high quality item and, even though it is high tensile aluminium alloy and this is a sport, economy engine, it is still fitted with bronze bushes both ends for maximum life. A lot of engines are now being made with no bearings in the conrod, relying on the aluminium for a wearing surface, which is generally okay except where the aluminium galls or picks up a little bit of grit. The bronze is much more tolerant in this regard. The little end of the rod is slotted for oil access, and the big end has a hole positioned to take advantage of the downward stroke providing a form of injection. The gudgeon pin is fully floating (moves in both the rod and the piston), and fitted with Teflon rub pads each end.

Crankshaft

A one-piece unit of heat treated, high tensile steel, 12 mm diameter on the bearing section. I find it quite pleasant to use my extension eyeball (magnifying lupe) to cast a critical eye on work such as this. Every little point is done by the book. Thread end chamfered, no burrs, each shoulder at a diameter change has a radius to eliminate weak points, no drag marks on the milled surfaces and the ground bearing areas have a finish like polished chrome. The absence of a centre cone in the end of the shaft indicates, perhaps, jig-holding for finish machining, or a centreless grinder, either of which would give the required accuracy for less handling time, even by the robot machinery used for all manufacturing processes by OS. The propeller driver is fitted to the shaft by a flat section commonly known as a D drive, as the hole is a D shape. (That's logicical, I suppose.) Behind the prop driver is a steel shim washer to stop aluminium to aluminium contact and excess wear, particularly when an electric starter is used. Do not lose the washer as its function is quite important.

Carburettor

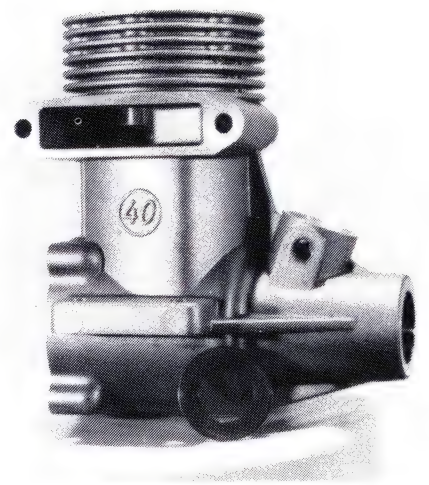
The carburettor is the OS 3A airbleed style, a proven design that has been used by OS for many years. These carbies are simple to adjust and set up, and once done can be left as is with just minor main needle changes in extremes of weather. Although the carbie is reasonably simple in design, there are still 13 components in its construction, and these units made up for their function are available as separate spare items. For example, you can purchase the air needle and spring or the idle speed setting screw and spring, needle assembly, throttle arm or just the body.

Main mixture adjustment is by the usual needle valve assembly, idle mix is adjusted by the air bleed screw in the front of the body, and idle speed by the barrel stop-retaining screw placed vertically in the rear of the body. Throttle arm adjustment is achieved by loosening the Phillips head screw inside the body of the arm. When choking this type of carburettor, the barrel must be in the fully open position otherwise you will just suck air through the idle mix air bleed hole. The carby is sealed into its position by a fine section O ring and retained by two screws through the manifold threading into the carb spiggot. A reliable, trouble-free unit that is ideal for beginners learning to adjust carbies, and a snack for established modellers.

The Go Factor

Well, apart from the bolts and rear paper gasket, that's all there is to this unit, so let's see how it performed. Before I go into the prop figures I want to point out something that astute readers will notice and cause them to scratch their heads. The specifications of the engine indicate a potential 16,000 rpm, but my prop figures only go up to 12,500. Why is this so? First off, if you have been a driver or rider for some time I am sure you have seen a tachometer fitted to some vehicle. Did you notice that it had a red line marked on the scale down a bit from the top rpm? Okay, say your motor vehicle has a maximum top rpm count of 8,000, and at that engine speed you are doing 100 kph, which is a common speed for most drivers. (Except when I am around. Snigger; snigger!) How long is the engine of your car going to last being run flat out most of the time? There are two good ways to overcome this problem. One is the way of the good old VW, that has a top engine speed of 3,600 rpm, and it could be run flat out all day without showing any stress whatsoever. (My dear wife has a '52 model that she uses every day. Had it for about 20 years and it still goes like a chaffcutting Swiss watch.) Problem is that this doesn't suit the majority of drivers who are 'rev heads' and can't be convinced that a car can do the job on less than 40,000 rpm. Well, design the engine to do 10,000 rpm and red line it at 8,000. That way the engine is generally driven below the red line, is not overstressed and the blockhead owner can still go on his ego trip by claiming that his chariot can do 10,000 in first gear. One other main factor is that the lower engine speed gives out less noise.

Now ... Apply this principle to model engines. The OS 40 is designed to withstand 16,000 rpm without disintegrating, but this figure is only obtainable with a prop so small that it would have little application for .40 size modelling. At 12,000 rpm the engine is running up to only ¾ of its potential speed, so it is well understressed and its useful life is extended quite a considerable amount. I have this information officially, that 50% of production time in the OS factory is now spent on developing quieter engines. Running an engine between 10 and 12,000 rpm is certainly 50% quieter than at 16,000.



No compromise with quality in OS casting of this economy model. Shim washer prevents wear of prop drive disc against front of crankshaft bearing.

Now, on with the figures I obtained using Magnum sport fuel, which is a top, all-round brew, Taipan green plug because they haven't yet let me down, and a couple of Bolly props 'cause Les Bolly'n had a moan that I wasn't using his product. Actually, I do for flying, but I now have a range on my test bench and they really give out the goods. Good on yer Les.

Taipan	10 x 6	11,500
Bolly	10 x 6	11,750
Wide blade GRP	10 x 6	11,250
Narrow Zinger, wood	10 x 6	11,750
Zinger	9 x 6	12,500
Master antique	10 x 5	12,000
Taipan	11 x 5	10,250
Magnum	10.5 x 7.7	9,500
Bolly	10.5 x 8	11,000
Bolly 4-blade	9.5 x 6.5	11,000

Best reliable idle was 2,500.

Well, anyone with half an eye can see the performance and how it improved as the load was applied, just like a steam engine. At last the manufacturers are seeing the writing on the wall. Modellers want an engine that has the lugging power to drive a load without stress. Leave the high speed engines for the pylon racers, the speed yo-yos and boats, while the rest of us preserve our flying fields with powerful but quiet engines. If you are in the market for a reliable, good performance, sport .40 at a bargain price, read this article again in case you make a mistake in choosing.

Test engine supplied by Model Engines (Aust.)

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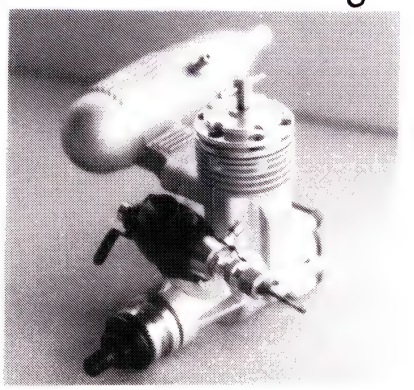
IRVINE 20 ABC RC DIESEL

We now have in stock the long-awaited IRVINE 20 ABC RC DIESEL. Owners of existing Irvine 20 or 25 Glow engines will be able to use the new 20 diesel in its place. The Irvine 20 diesel is a modern Schneurle ported engine with an ABC piston and liner for improved performance and handling.

A new solid aluminium body carburettor is provided with the IRVINE 20 ABC RC Diesel. The new Jetstream RC carburettor is an all metal assembly comprising anodized black, solid machined aluminium alloy main body, machined brass jet assembly, machined and polished steel barrel, and steel needle valve and throttle arm. This new carburettor will offer greater crash resistance and more precise mixture setting ability.

A nice feature provided by Irvine is the ability to lock the compression lever in place once the running setting is found. This is achieved by means of a grub screw in the side of the cylinder head. The grub screw can also be set to give the right amount of drag on the compression lever for a more precise feel during adjustments. Nice one, Irvine!

Why use a diesel? For a start, a diesel engine does not require an expensive glow plug to run. The diesel tends to turn a much larger prop.



The diesel will produce more power at low rpm and will pull a heavier aircraft with greater ease than a glow engine of equivalent displacement, and they are relativley quiet as well.

Irvine recommend a fuel of approximately the following mixture for their Irvine 20 ABC Diesel:

30% Ether
48% Kerosene
20% Castor Oil
2% Iso Propyl Nitrate (IPN)

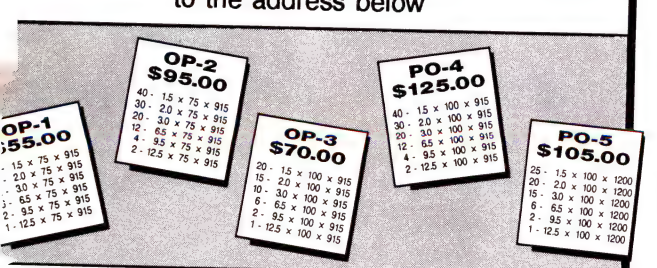
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IRVINE 25 BLACKHEAD Stunt	SE, FI
IRVINE 30 Stunt	SE, FI
IRVINE 40 Stunt	SE, FI
IRVINE 40 Speed w/o muffler	SE, RD
IRVINE 20 R/C	SE, FI
IRVINE 20 BLACKHEAD R/C	SE, FI
IRVINE 20 ABC R/C	SE, FI
IRVINE 21R ABC R/C	RE, FI
IRVINE 25 R/C	SE, FI
IRVINE 25 BLACKHEAD R/C	SE,FI
IRVINE 25 Helicopter	SE, FI
IRVINE 30 R/C	SE, FI
IRVINE 40 R/C	SE, FI
IRVINE 40 Speed R/C	SE, RD
IRVINE 40R R/C	RE, FI
IRVINE 40 ABC R/C	SE, FI
IRVINE 61 R/C	SE, FI
IRVINE 61R R/C	RE, FI
IRVINE 61R R/C w/piped liner	RE, FI
IRVINE 61 ABC R/C	SE, FI
IRVINE 20 Marine	SE, FI
IRVINE 20 ABC Marine	SE, FI
IRVINE 21R ABC w/o Flywheel	RE, FI
IRVINE 25 Marine	SE, FI
IRVINE 40 Marine	SE, FI
IRVINE 40 ABC Marine	SE, FI
IRVINE 40R ABC Marine	RE, FI
IRVINE 40 ABC Marine	FE, FI
IRVINE 61 Marine	SE, FI
IRVINE 61R Marine	RE, FI
IRVINE 20 Car	SE, FI
IRVINE 20 ABC Car	SE, FI
IRVINE 21R ABC Car	RE, FI
IRVINE 21R ABC Car w/o carby	RE, FI
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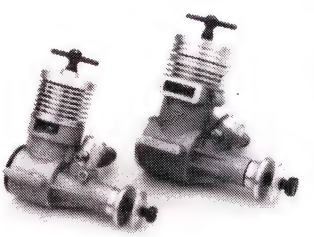
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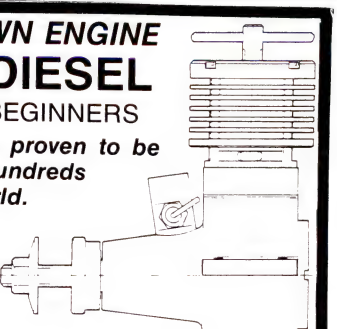
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Carl Dodge, US ace speed flyer, whipping his model at the start of his Pacific Champs winning flight of 289 kph. Carl bent the pylon in practice! Photo by Alan Lawrence.

Contest Capers and Covering for Combat, with photos from many sources.

I would like to give the credit for preparing the report of the 1st Pacific Control Line Champs to David Wright and Andrew Robinson, both of New Zealand. A review of Carl Dodge's 289 kph engine and model, as used at the Pacific CL Champs, with some excellent photos by Robin Hiern and Alan Lawrence, is coming soon, so keep your Airborne subscription current. In this issue we present Maris' innovative, new and neat way of covering combat models in mylar. Also, Merv Cox dropped us a line from Qld., and, as the letter invites a response from Airborne readers, here is what he has to say:

"Dear Ivars and Maris,

The Qld State Champs were held over the May Day long weekend. The events held were contested with determination and good sportsmanship. Entries in Scale, Stand-Off Scale and Slow Combat were up on last year, however, not so for Speed, FAI Combat and Open Combat. The general opinion in Qld on these events is that they are "over ruled", and a lot of interest has been lost. I would like to hear a response from other states on this point, perhaps through Airborne. We were pleased to see entries from David Murrell, Frank Battam and Reg Towell, who travelled from Coffs Harbour and Sydney to enter Scale and Aerobatics. Their efforts were not in vain, and I pass our hearty thanks and appreciation on to these guys. In all, a fun Champs was had by everyone, and we saw some really good flights put in."

Comments will be published in the column, but I encourage readers to communicate their thoughts to Merv Cox at 15 Turnbull St., Shailer Park, Qld., 4128; phone (07) 209 8881. I suspect that the current rules could not be substantially shortened without opening loopholes, but things like warnings and disqualifications, as well as some specifications like engine tethers in combat could be standardised so that the rules would become easier to learn and remember.

Need a new Rossi 15 crankshaft or the piston and liner? Is finding original Rossi 15 spare parts difficult? Contact Andy Kerr, 2 Woodberry Road, Winston Hills, 2153, for prices and availability of his own manufactured replacements for Mk2 and Mk3 versions. Andy also makes a special single blade counterweight spinner for squared hub Bolly and Supercool Racing Props single blade speed propellers.

Finally, clubs are signing up new members now. Club lists have been published in the MAAA News section of this magazine. If you live in Adelaide you can contact Maris on 287 0736 about joining the Adelaide Aeromodellers' Club.



And this is the model that Dodge brought over from the States. This pic by Robin Hiern gives an overall impression. It is very difficult to photograph!

1st PACIFIC CONTROL LINE CHAMPS
4 & 5 February 1990, Carterton
by Dave Wright

As the Pacific Champs was a new venture, no-one really knew what response we would get. It was advertised overseas (more than in NZ, it seems), with features appearing in Aeromodeller (UK), Model Aviation (USA) and Airborne. We were able to glean ideas from the FF Tech Committee. Overall it was a great weekend, and the presence of two overseas flyers was a real boost. The whole site was grassed and, after a cut on Saturday, the new grass circle was fine. The surface is not perfect, but presented no problems. Rob Collins has been working on the site over the last year and his efforst have resulted in a terrific facility which isn't finished yet. The dominant wind direction meant that any turbulence from the trees went between the circles, however, the wind in the trees made quite a bit of noise and made it seem stronger than it really was.

Entry numbers were not high, but the quality was. The Championship attracted two overseas entries. Robin Hiern (Australia) and Carl Dodge (USA), both in Speed. Robin is one of Aussie's fastest speed flyers, and Carl has been a top flyer on the world speed stage for many years. Expec

ations were high that we'd see something special in Speed.

The 3rd Pacific FF Champs were held at the same time. This included the Trans Tasman Challenge. There were lots of green and gold tracksuits around. The FF Tech Committee had made all the arrangements for camping, the banquet and so on, and generously allowed us to use them. The FF Champs had top-class organisation: posters, stickers, T shirts, free stop watches for the time keepers - they did a brilliant job. The gaining of a major sponsor was a great move. Any ideas for a suitable commercial sponsor to back a major CL event, Nats or 2nd Pacific CL Champs?

F2B Aerobatics

This was the first event, being flown in calm, hot conditions on the Sunday. There was some thermal activity, which caused changes in the direction of the little wind that there was. The clear sky meant that the sun presented problems for the flyers. The temperature was high. The judges were Sandy Sandersosn and Frank Visser. Frank is the brother of Hans, the leading European TR flyer and the V in FMV motors. Frank is a stunt flyer from way back, now residing in Palmerston North. He used a triangular frame to sight the model, to check on line angles - I've not seen it done before, but it was a good idea.

Three rounds were flown (best 2 to count), and very necessary breaks were taken to allow the judges to escape from the sun's heat and partake of liquid refreshment. Six competitors lined up to test their skills.

Phil Eldridge's flying has come on in leaps and bounds. He was flying a semi-profile model, not unlike Ted Fancher's Imitation. It was powered by a side mounted OS 40 FSR. The tank-motor system did not operate symmetrically, and the motor richened at some awkward moments. John Ryan had been trying to sort out a new model and motor in the week prior to the meeting. He couldn't get the new OS 40 FP to run properly. It exhibited the classic Schnuerle run; once in a two stroke it stayed that way, except it settled down into a four-stroke for the last few laps of each tank-full. After the competition, removal of the well ventilated cowl cured the problem (?). He reverted to his old model for the competition, but took time getting back to his normal form. Chris Allen had his superb ST60 powered Stiletto flying on 13 thou lines. The model is a foamie with removable tail and wing. Chris has been flying very well over the last couple of years. Owen Rogers has kept a low profile in the last year due to nest building activities in Palmerston North. He arrived with his old Esprit model, powered by his experimental motor. He has been working on an OS 40 VF ABC. It now seems to be sorted out as it gave a good run and turns a 13 x 6 with no strain at all. In the competition he used his Nats (88/89) winning monowheel Vortex with the trusty ST 60. Dave Wright flew his Quantum Leap II, also ST 60 powered. Now about 14 months old, the model flys well and features the triple fins which have been a feature of his models throughout the '80s. Allan Lawrence flew his well-known Classic design. The ST 60 turns a 14 x 6 prop, which is larger than most but it works superbly. After the traditional skiting about the amount of practice done, the serious flying got underway.



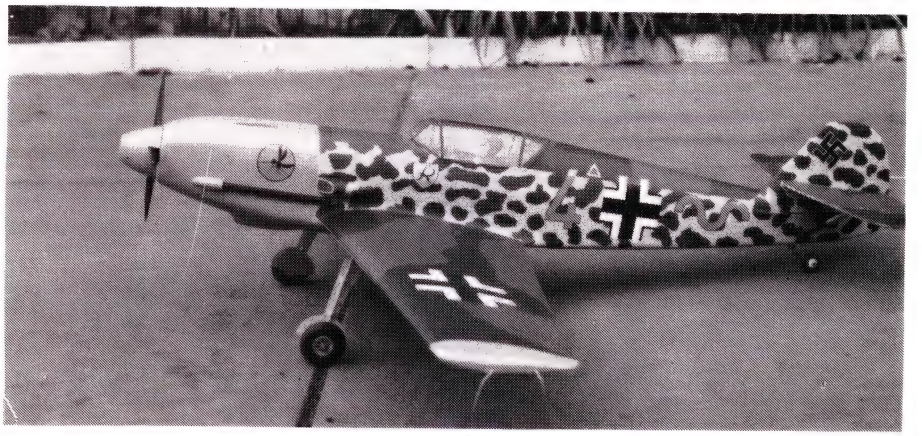
Goodyear race winners at the 1989 SA State Champs, Paul Cameron and Maris Dislers. Model is a Mr. D with Nelson F1 diesel. Les Bollenhagen took the pic. Probably a Bolly prop there!

In Round 1 there was little or no wind. Only Rogers and Wright didn't over-run. Eldridge's model free flighted a bit. Ryan was well below his usual standard. The round ended with Wright ahead with 1959, Rogers second and Allen third. It was clear that it was anybody's contest once the first round had settled nerves and models had been sorted out.

In Round 2 Ryan's motor cut out early and robbed him of valuable points. Lawrence had the wind shift several times during his flight so had the judges moving round the circle, but he improved his score and pulled up to 3rd place. Rogers and Wright were separated by only 20 points, the latter hanging on to his lead. The sun presented real problems, models disappearing into the glare for large parts of manoeuvres.

It was all still up for grabs in Round 3. Everyone was keen to pull one out of the bag. Lawrence put in the second highest score of the round, but it was not enough to lift his overall placing. Ryan was back on form but had too much to catch up. Wright put in the top score of the round to secure first place. (No wind so Wright wins. Ed.) The top three had only a spread of 117 points (out of 4,000), which is close.

The judges commented that manoeuvres



Me 109 built by Geoff Barnes of WA. Pilot and four bladed prop. Finish is classy: too good for a real warplane. This pic from Charles Stone.

tended to be too large and intersections wandered in all eights. Some contestants did not allow sufficient laps between take-off and the reverse wing-over. The model must pass over the point of release **five** times before the wing-over starts. Lap times varied from 5.5 to 5.8 seconds.

F2B Aerobatics

1. D. Wright (NZ)	4188
2. O. Rogers (NZ)	4120
3. A. Lawrence (NZ)	4071
4. C. Allen (NZ)	3765
5. J. Ryan (NZ)	3629
6. P. Eldridge (NZ)	3170

Combat

A disappointing entry, with only 3 flyers. Richard Dalziel had a stack of models, and was using a Nelson diesel. Glen Lewis had only one model. The bouts were entertaining, but I think they were slower than many seen in recent years. However, this did not detract from the quality of the bouts. A couple of line tangles brought two bouts to early ends. First out with two losses was Adrian Wellington. Glen Lewis broke his only model after losing one bout and winning another. This meant that he could not fly against Richard Dalziel, who won both his bouts, so Richard was declared the winner.

F2D Combat

	Wins	Losses
1. R. Dalziel (NZ)	2	0
2. G. Lewis (NZ)	1	1
3. A. Wellington (NZ)	0	2

Speed

Monday started off windy, and stayed that way. The speed pylon had broken during practice the previous night, so the start was delayed till 10 a.m. to allow time for it to be welded up at a local engineering shop. All six entrants had taken practice flights, and most were having trouble getting settings. Unfortunately, one of our leading flyers, Brian Howser, was unable to attend as he was recovering from illness. All eyes were on the overseas flyers. Robin Hiern has gone under 14 seconds with his Irvine 15 powered model, but he found that the motor soon went past its best. Carl Dodge's model had a longer, narrower wing than the rest of the entries. The model spanned 45 inches and was powered by a home-built motor. The motor was rear disc induction (unusual these days), and beautifully made. It featured two liners, a brass one (chromed) with the port windows, and another sleeve then fitted over it with the transfer passages cut in. The case had no transfer channels cut into it.

The wind was 7 to 8 metres/second, gusting

to 10. In the first round only two flyers got times on their first attempt. They were Robin Hiern and Bill Bell. Alan Barnes' model really sang until he had almost engaged the new pylon, when it went off. His hand was in and out of the yoke like a fiddler's elbow. Nev Low couldn't get the Rossi Mk3 onto the pipe and failed to record a time.

Robin Hiern provided some excitement in round 3 when his model did a wing-over out of the dolly. He had the foresight to step rapidly backwards so that it impacted on the grass, not on the concrete. He managed 14.59 seconds, which gave him 3rd place. Paul Coghlan covered several kilometres in the dolly, and couldn't get the motor to go.

The two fastest flights came from Carle Dodge and Alan Barnes. Carl had failed to get the right settings in his first round attempts and in the first attempt in round two. Then he put in a real ripper of a flight. The wing bends a great deal when flying slowly, and he whips very hard, swinging right out from the pylon. Suddenly the motor came on the pipe, and that was it: 12.43 seconds - 289.62 kph (180 mph) - the fastest seen in NZ. (Also only 0.7 seconds slower than the official USA FAI Speed record of 180.9 mph, current at 2nd May '89 and held by Carl. Ed.) The motor stopped suddenly after the timed laps, and later inspection revealed that bits of the big end bush were sitting on top of the piston. Alan Barnes was working hard to get his second home-made motor to go, and was rewarded in round 3 with 13.66 seconds, which was 0.01 seconds under the record he set at the Nationals; not a large enough margin to claim as a record. Alan has worked hard in this class for years, and everyone was delighted to see him do well.

Bill Bell, in fourth place, was the only entrant to record a speed in every round. So it was USA, NZ & Aust with the top three places.

F2A Speed

1. C. Dodge (USA)	12.43 sec.	289.62 kph
2. A. Barnes (NZ)	13.66 sec.	263.54 kph
3.R. Hiern (Aust)	14.63 sec.	246.74 kph
4. W. Bell (NZ)	15.31 sec.	236.69 kph

Team Race

This was due to start at 2.30 p.m., and by that time the wind had been gusting to 12 metres/sec, but as the afternoon passed it settled down to 6 to 7 metres/second. Two of the five entrants withdrew, so only three teams took to the air. Due to the gusting wind, it was decided to run 2-up heats. After two heats for each team they waived their third heat option and went straight into the final.

Peter Williams teamed up with Neville Low using Peter's Nelson (steel). They flew well together, their wing having no problem with the wind. Peter got a couple of warnings for whipping, but generally put on a great performance, with the fastest heat time of the day at 3:53.6. The Boltons were in fine form, with Robert showing some of the fastest pitting we've seen in NZ. The model was a bit short on laps, but did 4:03.2 with 3 stops. They flew cleanly and calmly. Glen Lewis and Paul Coghlan tried hard and managed 4:18.7.

The final had all the makings of a real classic. All were airborne immediately, and were similar in airspeed. However, as Williams-Low and Lewis-Coghlan came in for their last pitstop, disaster struck. Paul Coghlan had restarted and released his model, but the wind lifted its backend and the propeller clipped the ground as it staggered forward. At the same time Peter Williams' model was gliding in to land at the next segment and it struck Paul's model. Technically Lewis-Coghlan were at fault, as the landing model had priority, but really it was just bad luck. Had the tail not risen too far, the model would have been airborne and well away by the time the Williams-Low model arrived. But them's the breaks. The Boltons finished in 8:09.1, which is a personal best, so they were happy. It is clear that in both the north and south islands there is great Team Race talent. It looks good for the 1991 Trans Tasman.

F2C Team Race

1. Bolton- Bolton	4:03.2	8:09.10
2. Williams-Low	3:53.6	165 laps
3. Lewis-Coghlan	4:18.7	DSQ

The prize-giving was held at a dinner we shared with the free flighters at the Solway in Masterton. It was a great evening, and served to remind us that the social side of the sport is very important. Thanks to the FF Technical Committee for their considerable assistance. The present thinking is that the 2nd Pacific CL Champs will be held in 1993 in conjunction with the next TT in NZ. Thanks to all who helped and flew, and special thanks to Carl Dodge and Robin Hiern for travelling so far.

COVERING COMBAT MODELS

by Maris Dislers

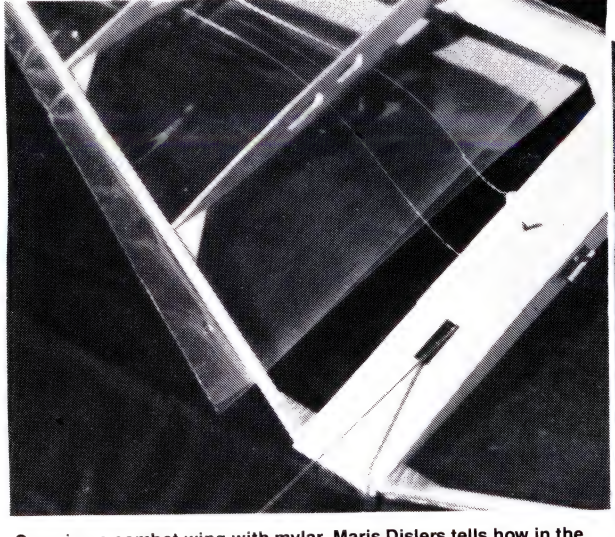
Covering combat models is always a chore for me, so any way of cutting down the time needed is a relief. The method described applies to covering open frame models with polyester films like DuPont's Mylar, which make an open frame model of correct design stronger than a foam model covered with common low temperature iron-on film. This method saves time and is stronger but, due to the nature of mylar film, it is not recommended for designs with compound curves. Experiments show that two pieces of mylar film will fuse together when heated, so the idea of a pre-made tube of covering over each wing was born. A kind of sock or sleeve is made of mylar, which is then slipped over the wing half, ironed into place and shrunk. As there are no leading or trailing edge seams to iron down, time is saved. The method described in this article prevents the possibility of a leading edge or trailing edge seam peeling open in use; hence more strength.

The Method

The trailing edge joint is made by **fusing** both edges of the mylar together with heat. Quite a bit of heat is needed to fuse properly. I used a paint stripping heatgun. A jig must be made to hold the edges together and protect the rest of your covering from heat. The jig may be made from straight hardwood about 40 mm square, or from extruded aluminium angle. Make your jig over-length to give space for clamping. Cut a piece of newspaper as a trial piece to see what shape of covering you need, creating a pattern. Lay the newspaper from the trailing edge of one wing half, around the leading edge and back to the trailing edge. Pin the overhang together and trim it off about 3 mm out from the trailing edge. Extend each end a little. Ends can be trimmed off later. Using the paper pattern as a template, cut the mylar to shape. Clamp the edges of the mylar into the jig, allowing for a 3 mm overhang. Fuse them together with heat until the joint draws into a solid bead. You are ready to cover now.

Paint all surfaces, including ribs, with Balsarite. I find that it adheres better to mylar's smooth surface than Balsaloc. Allow it to dry. Slip the covering on and tack it down to the root, the tips and all the ribs. The leading edge and trailing edge need not be tacked, as the heat when shrinking will do the job for you.

Although there is some initial setting up, the time saved by this method is well worth it.



Covering a combat wing with mylar. Maris Dislers tells how in the text. This pic was taken during the operation.



Richard Bellis' FAI Combat machine at the Bunbury Nats. Nelson rear induction engine has alloy engine bearers. Photo by Graeme Wilosn.



Wind and Wales

by Iain Kirley

A congested first leg of a heat of the R10Rs at the Nationals. Skippers concerned should remember this tussle. Photos this issue from Iain Kirley.

COMING EVENTS

Tasmania 1990

September 15 & 16: RM Titles; Hobart
November 24 & 25: R10R Titles; Launceston

New South Wales 1990

October 13 & 14: RM Titles; Mt. Penang
November 24 & 25: R10R Titles; Mt. Penang

N.S.W. 1991

March 23 & 24: EC12 Titles; Mt. Penang

AUSTRALIAN CAPITAL TERRITORY 1990

October 20 & 21: RM Titles; Bowen Park
November 3 & 4: R10R Titles; Bowen Park

ACT 1991

March 2 & 3: RA Titles; Bowen Park

Nationals - Adelaide

January 3 to 13 1991; West Lakes
Classes: EC 12 - 3 & 4 January
R10R - 5, 6 & 7 January
RM - 8, 9 & 10 January
(Note: 11 January is a lay day or extra day for RM if needed.)
RA - 12 & 13 January

CONTACT:

NSW, Tasmania and the ACT have recently had their Annual General Meetings, and the new state secretaries are as follows:

NSW: R. Shedden, 17 Aspen Avenue, Terrigal, NSW, 2260
ACT: A. King, 39 Von Guerard Cres., Lyneham, ACT, 2602
Tasmania: G. Fish, 89 Forest Road, Launceston, Tas., 7250

ONE METRE CLASS

I recently received a latter from a reader requesting information on the new One Metre Class. This class is rapidly increasing in popularity overseas and, according to New Zealand's model yachting news, at least seven are under construction on the land of the long white cloud. This new class draws on the class rules of the old 36 inch class and both the European and US One Metre Classes to form a new international One Metre Class.

The basic rules are as follows:

Hull length (including bumper) 1 Metre
Hull draft (in fresh water) 60 mm max
Weight of yacht (in race condition) 4.0 kg min
Fin (has to be removable)
- Weight 2.2 kg min; 2.5 kg max
- Draft (in fresh water) 370 mm min
420 mm max

Mast and sails. The class has three one-design rigs with the largest rig having about 760 sq. in. of sail area.

Mast height
about 1.75 metres (No. 1 rig)
1.5 metres (No. 2 rig)
1.0 metres (No. 3 rig)

Currently this class has not gained National Titles status, but the National registrar will be registering boats as measurement certificates are submitted. When the class has sufficient boats registered the National association will consider the possibility of future Nationals for the class. Currently I do not know of any local designs available. If there are any designers who have a design available to meet the latest rules, please let me know and I will pass on the information to readers.

The size of the class allows the hull and mast to fit in even the smallest vehicle, but it must be remembered that the rig changes occur sooner than that for the RM class.

CONSTRUCTION TIPS

Hatches. There are a number of designs available for hatches, but the most common medium is plywood. The size of the hatch is dictated by the size of the hole or holes required in the deck to allow access to internal components. I usually have a hatch above the rudder and a second one above the winch and battery box. The rudder hatch is usually small, about 6 to 8 cm square. The winch hatch is larger; 10 to 15 cm square.

During the construction of the hull I fit a hatch coaming around both holes. These project about 6 mm above the deck. The hatch is constructed to fit over the coaming and consists of a plywood top and softwood sides. I also glue thin strips of closed-cell neoprene rubber around the top of the hatch where it comes into contact with the coaming to give a water-tight seal.

To hold the hatch down I either use a hook glued to the underneath of the hatch with a



Steve Crewes emptying water out of his R10R after some sailing in rough water. Don't splash that transmitter, please!



Vic Steel, one of Sydney RC Yacht Club's elder statesmen, enjoying a sail at Centennial Park. A sport for gentle men.

rubber band to a second hook on the hull, or I have a rotating arm below deck that engages below the coaming. The latter method will hold tight in a cyclone, but the boat may not.

NEW ZEALAND NEWS

RM Nationals

Twenty eight competitors entered the event, which was sailed in two fleets of 14. Three preliminary races were followed by 17 fleet races.

Results:

1. Geoff Smaile	**Kiwi Concept**	**28.5**
2. Robert Wattam	**Kiwi Concept**	**38.5**
3. Bruce Edgar	**Boxer**	**66.8**
4. Peter Cameron	**Havoc**	**97.7**
5. Frank Linney	**Havoc**	**101.1**
First Junior:		
13. Andrea Chisholm	**Haka**	**180.0**

New Zealand has three entries in the 7th RM World Championships to be held at Fleetwood in England from 18th to 20th August 1990. David Coode, an Englishman who frequently sails with the Kaiapoi club, will also sail as a member of the NZ team if a fourth entry is permitted. The team will consist of Geoff Smaile, Robert Wattam and Bruce Edgar.

New Zealanders recently came first and second in the Queensland RM Championships. Paul Chisholm finally won the Titles after a number of visits, followed by David Watson. David Coode came third.

NZ Class News

One Metre. Currently seven are under construction to various designs, with the Wellington club leading the way, but as yet none has hit the water.

RM. The most popular class in New Zealand, and probably the world, yet only a small proportion of the skippers attend National Title events. Sounds similar to Australia, but distance is a bigger problem here. An interesting fact is that the first three boats home in the NZ Nats were local designs.

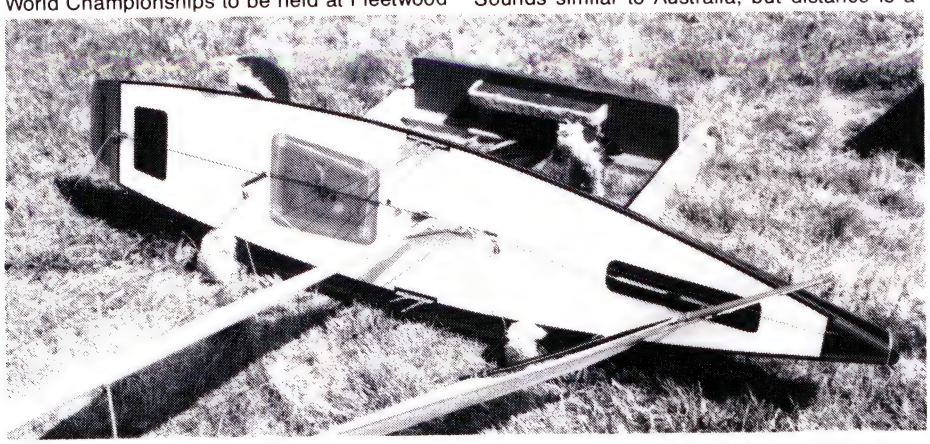
EC12. This is the only other class to have Nationals status in NZ, and this year the Titles are to be held in Christchurch.

R10R. Currenlty only a few boats have found their way to New Zealand, but last January three New Zealanders competed in Canberra, and it is rumoured that one or two may attend a major R10R event in Britain next year.

AT THE TOP END

I have had a request from Doug Henderson, who lives in Tindal in the Northern Territory, for information on any RC sailors in the Top End. Currently my search has resulted in a big zero, so if there are any skippers in the Darwin area, either let me know and I will pass the information on to Doug, or you can contact Doug direct at 1 Scherger Place, Tindal, 0853.

If you have any yachting problems, please write to me at **RMB 431, Macs Reef Road, Via Bungendore, NSW, 2621.**



A Frank Russell designed Phoenix R10R at the Nationals in Canberra. Nice pic by the columnist. Nice boat with a lay-down stand. But whose?

BOOK REVIEW

Radio Control Scale Boats, by John Cundell

This is the latest in a series of Radio Control Handbooks published by Argus Books, and follows on from 'Installing Radio Control in Model Boats' by the same author, which was reviewed in an earlier issue of Airborne. If you have seen a radio controlled scale boat in action, this book is one that you should read if you would like to build your own boat and enjoy this fascinating hobby.

Other books on the subject are mentioned, as is the warning (which also applies to other forms of model making) not to pick a complicated original for your first attempt, and that a medium sized model is easier to build, and sails better



At Central Coast MYC Presentation Night on 28 April. Bob Sheddon, Frank Russell, Mike Newman, Terry Thearle and Phil Page. See past results for their exploits. Hardware indicates they get blamed for everything that goes on up there!



R10R owned and sailed by Terry Thearle in gentle conditions. Could be Canberra!

than a small one. We then come to the type of model. What would you like to make? A warship, or maybe a fishing boat, or then again perhaps a merchant ship is your ideal. Within these categories there is an enormous number of vessels, and the differences and suggestions as to which would be best for a beginner are mentioned.

Mention is also made as to what not to start with. For instance, you might fancy the Queen Mary, but did you realise that you would have to make 2,000 port holes, hundreds of windows, 22 lifeboats and three funnels, each of a different size, for such a model? Again, there are submarines. Very interesting, but not for your first scale boat.

Now, if you are keen to start building, the next chapter explains that building a kit is probably the best way to start. There is no stigma attached to scale modelling from a kit, for, after all, this is only a plan with all the materials supplied. The quality and interpretation of the end result is up to the builder. The variety of kits is vast, and the author cites the example of one store in the UK that lists 179 kits. Here in Australia we may not have quite as many, but I know of at least one supplier who would come close, so shop around until you find what you want.

If you are really enthusiastic you can progress from this point and scratch build; that is, pick a subject and research it. There are instructions on how to do this, and the formula to use to make sure that your version will float and not sink or capsize.

Building comes next, so hull construction is explained and the different materials that can be used, including wood, glass re-inforced plastic, vacuum molded styrene, and the less common tin plate. Do you want to use electric propulsion as do about 90% of scale modellers? Or perhaps the idea of a steam engine is more for you. These are covered, as is the use of an internal combustion engine, although the latter is not often found in a scale model boat, except for high speed launches. Radio systems are commented on to give the basic components and their functions. There are also notes on frequencies, but in the main these are not applicable in Australia.

Finally. the tools which the author recommends are listed. He comments that they need not all be bought at once, but when you do buy a tool, get the best that you can afford and it will last a lifetime. This is something which I heartily endorse. Birthday and Christmas presents are another way to get tools, if the family do not know that to get for you. Also included in this chapter are adhesives and their applications.

While this book does not go into great detail on any particular area of scale model boats building, it is an ideal place to start for a beginner, and can be recommended to anyone who thinks that they might like to take up boat building. Argus Books are distributed in Australia by Princeton Books in Cheltenham, Victoria.

N.S.



A new R10R Phoenix, by Frank Russell. LOA is 6 in., LWL 53 in., Beam 11.4 in., BWL 9 in., Displacement 14 lb 12 oz., Lead 10 lb 4 oz., SA 1412 sq in. ***Haven't ratings been metricated?***



RAs contesting the lead at the Nationals. KA 291 is by Paul McGilvray of the ACT, 287 is by Rod Clack of Victoria, and 288 is Ron Attard's, also from Victoria. Close racing is fun! Note different batten pockets on KA 287.

THE MARINE SCENE

V.M.P.B.A. INTERCLUB RACEWAY
Round 1, 26.6.'90; Edwards Lake Reservoir
from Peter Bass

The weather was mostly sunny, with a cold, north wind of approx 8 knots. Edwards Lake Reservoir, home of the Melbourne Model Boat Club, is arguably one of the best model boating lakes in Australia. It is perfect for all types of radio controlled model boat racing, including straight line speed. The idyllic setting almost makes you sit back and relax and watch the action. Notice that I said 'almost'; the exhaust smell of Allen Mawhinney's high-nitro dosed hydroplane wafting over the area brings you back to reality and to the task at hand; competition!

22 competitors faced the starter in round 1 of the 1990 VMPBA Inter-Club Championship Series for Multi-Boats, Mono-Oval, Tunnel and Hydro-Oval events. The number of entreis was less than anticipated, but the enthusiasm of the competitors made up for that. I am sure that, as the series progresses, those who missed the first round will join in for some excellent competition in the 3 remaining rounds for 1990.

Multi-boat racing started the program, with fields in 3.5, 7.5 & 15 cc classes, as is usual. The choppy conditions didn't have a disastrous effect upon the performance of these boats, except for the 7.5 cc boats, as these are basically 6.5 cc hulls with 7.5 cc engine transplants, the extra power bringing out a few hull tweaking problems. These will be ironed out with some fine tuning as the series progresses. In the 3.5 cc class, Wayne Hosking (MMBC) narrowly defeated Shane Bailey (GMBC), 14 to 13.2 laps, with Aaron Evans (EMMBC) in third place with 11.1 laps. The 7.5 cc Multis were next onto the water. Peter Bass (RMBC) drove his OPS powered Omega 50 into first place with 24.4 laps, followed by George Groves (RMBC) with 18 laps. Aaron Evans had trouble with the choppy water and came in third with 9.2 laps. The 15 cc class provided plenty of action, with Aaron squeezing George out of first place with 26.2 to 24 laps.

Points awarded for the meeting were as follows:

3.5 cc Hydro	Tony Ricciotti	6
	Craig Chenco	3
7.5 cc Hydro	John Mantovani	5
	Stephen Hoare	2.5
	Craig Chenco	1.6
15 cc Hydro	Andrew McIntyre	5
	Scott Evans	2.5
	Steven Bass	1.6
3.5 cc Multi	Wayne Hosking	3
	Shane Bailey	1.5
	Aaron Evans	1
7.5 cc Multi	Peter Bass	5
	George Groves	2.5
	Aaron Evans	1.6
	Ian Hay	1.2
	Murray Hunter	1
15 cc Multi	Aaron Evans	5
	George Groves	2.5
	Doug Mumford	1.6
	Peter Bass	1.2
15 cc Tunnel	Tony Ricciotti	3
3.5 cc Oval Mono	Rod Boxall	4
7.5 cc Oval Mono	George Groves	5
	Peter Bass	2.5
15 cc Oval Mono	Peter Bass	5
	George Groves	2.5
	Aaron Evans	1.6

Top 3 placings after Round 1:

Peter Bass	13.7
George Groves	12.5
Tony Ricciotti	9.0

The next class to race was the 3.5 cc Oval Hydros. The choppy water didn't suit these boats, or any other hydros for that matter, and the results are testimomny that, if you want a boat which suits most weather conditions, Multis are the choice. (Not biased much, eh!) However, out of 2 heats Tony Ricciotti (MMBC) gained 2 wins (436 points), with Craig Chenco (MMBC) in 2nd place with 185 points. Twelve drivers started in the 2 heats and only 3 finished. Tony's boat was powered by a Nova Rossi. Of the 7.5 cc Hydros, John Mantovani (MMBC) was first with 224 points and Stephen Hoare (RMBC) was second driving his super-quick 45 Stinger powered by a highly modified OPS 45. (Steve has actually programmed a computer so that he can get a read-out of the modifications necessary to get the OPS really singing.) In the first heat of this class all boats secumbed to the elements, and again in the 15 cc Hydro class DNFs dominated the results, with only 3 finishers out of 10 starters, in the 2 heats. The winner was Andrew McIntyre (MMBC) with 223 points, ahead of Scott Evans (MMBC) driving his huge, normally twin 90 cc CMB powered Hydro, with 219 points. Steven Bass limped into third with 183 points.

Due to a lack of entries in the 3.5 & 7.5 cc Tunnel classes, the next class to race was the 15 cc Tunnels. Tony was the only finisher, with 215 points.

It was a sad tale also in the 3.5 cc Oval-Mono where, out of 4 starters there was only one finisher, that being Rod Boxall (RMBC) with 302 points. Rod is proving to be a real talent, as he is a relative newcomer to power boating, and his skill was evident as he drove his flighty deep-V in the choppy conditions. In the 7.5 cc Mono, George G just pipped out Peter B, with 420 to 416 points, up to date the only 2 competitors to complete 2 rounds of Oval. (Was it because they ran Multis, or was it because they both have 'fungus' on their faces.) Groves and Bass were again swapping places in the 15 cc Mono, with Peter victorious this time, 429 to 220 points. David Evans came in third with 186 points. Fastest time for 5 laps in Oval was Tony R with a time of 73 seconds, with his 7.5 cc Hydro. Believe it or not, George was only 7 seconds slower with his Multi!

The results reveal that, unfortunately, the standard of preparation of boats leaves a lot to be desired (the choppy conditions cannot be blamed for all the DNFs!). I think the major reason is that too many model boates are trying to break the sound barrier instead of concentrating on reliability. In all but 3 heats of Oval racing (out of 14 heats), the whole field either did not start or did not finish! The notable destruction of the day was made by Allen Mawhinney. His works K&B 80 broke the gudgeon pin and pulled out the bottom of the piston. New modified versions are hurriedly being flown out from the States, and when these are fitted the new K&B 80 looks like it will be a real goer!

All in all it was a reasonable day's meeting.



Dr Jock Peden with his immaculate 45 Strapper. Who else has tried wings on the front outrigger spar?

BOATS ON THE GO!
V.M.P.B.A. Calendar

Sept. 2:	RMBC; VFL Park, Mulgrave
Sept. 15 & 16:	Straight Line Speed; Numurkah
Oct. 7:	RMBC; VFL Park, Mulgrave
Oct. 13 & 14:	Victorian Championships; VFL Park, Mulgrave
Nov. 3 & 4:	Gippsland Model Boat Club; Churchill Lake, via Morwell
Nov. 18:	RMBC; VFL Park, Mulgrave
Nov. 25:	Barham Indy Day; Barham, NSW
Dec. 16:	Xmas Party; VFL Park, Mulgrave
Dec. 26 to 30:	Natioinal Titles; Strathpine, Qld

Please contact your local club for additional racing days that are not listed above.

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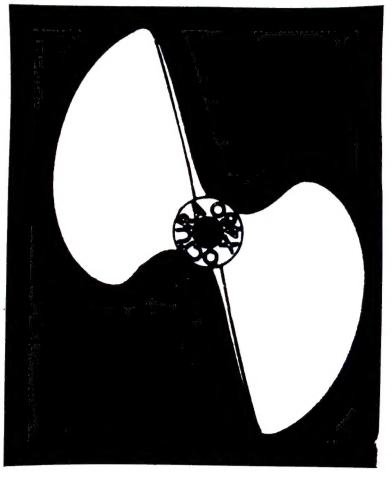
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Control Tower, 183 Anderson Drive, Beresfield, 2322; **(049) 66 1083**
Hobby City, 225 Clarence St., Sydney, 2000; **(02) 29 4900**
Hobby Headquarters, 14/10 Yalgar Road, Kirrawee, 2232; **(02) 545 1944**
Hobby World, 46 Treacy Street, Hurstville, 2220; **(02) 570 8444**
Jordal Hobbys, 1-31 Forge St., Blacktown, 2148; **(02) 622 9996**
Jordal Hobbys, 1, 9-11 Johns Ave., Gordon, 2072; **(02) 498 3675**
Jordal Hobbys, 397 Anzac Parade, Kingsford, 2032; **(02) 662 1025**
Kellett's Hobbies, Shop 12/317 Macquarie St., Liverpool, 2170; **(02) 602 2970**
Model Radio Control, 360 Hector St., Bass Hill, 2197; **(02) 644 3264**
Model Sports, 19 Princes Highway, Fairy Meadow, 2519; **(042) 84 0813**
Plumtree Models, Shop 23, IMB Arcade, Lower Crown St., Wollongong, 2500; **(042) 26 1555, 83 3183**
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Toyman Imports Warehouse, 76 Railway St., Yennora, 2161; **(02) 632 5002**
Vaggs Radio Models and Hobbies, Cnr. Kiora Road and Kingsway, Miranda, 2228; **(02) 525 5797**
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VIC.

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ABC Models P/L, 424 Station St., Box Hill, 3128; **(03) 890 6845**
ABC Models P/L, 102 Bell St., Coburg, 3058; **(03) 354 1268**
ABC Models P/L, 118 Foster St., Dandenong, 3175; **(03) 792 9528**
ABC Models P/L, Shop 1, 8 Olsen St., Frankston, 3199; **(03) 783 4288**
Brosters Toys and Hobbies, 46 Murphy St., Wangaratta, 3677; **(057) 21 8708**
Dee R.C. Models, 14 Tallarok Street, Seymour, 3660; **(057) 92 3660**
Eastern Hobbies, 140 Canterbury Road, Heathmont, 3135; **(03) 729 4170**
Finescale Models, Shops 4 & 5 Central Arcade, Murray St., Colac, 3250; **(052) 31 4289**
Fliteline Models, 9 Pilgrim Crt., Ringwood, 3134; **(03) 873 4252**
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Hawthorn Hobbies, 733 Burwood Rd., East Hawthorn, 3122; **(03) 882 7521**
Hobby Hangar, 1 Derby Rd., Caulfield East, 3145; **(03) 211 4788**
Hobby Hangar Two, 600 High Street, Kew, 3101; **(03) 817 2401**
Hobby Service Electronics, 85a Hoffmans Rd., Niddrie, 3042; **(03) 337 0751**
Kraft Systems, 59 Ryrie Street, Geelong, 3220; **(052) 29 2191**
Metropolitan Model & Hobby Centre, 147 Springvale Rd.,Nunawading, 3131; **(03) 877 6692**
Micro Electronics, 20 Glyn Street, Belmont, 3216; **(052) 44 2336**
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Tates Discount Toy Warehouse, 135 Shannon Ave., Geelong West, 3218; **(052) 22 4201**
Victorian Hobby Centre, 1st Floor, 21A Swanston St., Melbourne, 3000; **(03) 650 4817**
Williamstown Hobbies, 177 Ferguson St., Williamstown, 3016; **(03) 399 9262**
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Mr. Toys Toyworld, 3379 Pacific Highway, Springwood, 4127; **(07) 208 9750**
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Southside Hobby Centre, 216 Logan Rd., Buranda, 4102; **(07) 393 0537**

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ABC Models P/L, 117 Unley Rd., Adelaide, 5000; **(08) 373 1191**
ABC Models P/L, Shop 3, 1700 Main North Rd., Salisbury Plain, 5109; **(08) 258 44**
Hobby Habit, 462 Main North Road, Blair Athol, 5084; **(08) 349 6242**
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Model Flight, 670 Main North East Rd., Holden Hill, 5088; **(08) 261 0396**
Model Mania, 253 Main South Rd., Morphettvale, 5152; **(08) 382 4957**
Northern Discount Hobbies, Corner North East and Tartan Rd., Holden Hill, 5088; **(08) 261 89**
South Australian Hobby Centre, 1st Floor, 135 Rundle Mall, Adelaide, 5000; **(08) 232 00**

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North Australian Model and Hobby Supplies, 61 Dalwood Crescent, Sanderson, NT, 0812; **(089) 27 72**

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Burimex, 137 Pyrmont St., Pyrmont, NSW, 2009; **(02) 692 0694**
Competition Engines, 117-119 Anzac Parade, Kensington, NSW, 2033; **(02) 662 1025**
Competition Engines, 1, 9-11 St John's Ave., Gordon, NSW, 2072; **(02) 418 1568**
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JR Remote Control Aust. Pty. Ltd., 424 Station St., Box Hill, Vic., 3128; **(03) 890 0660**
Kraft Systems, 59 Ryrie Street, Geelong, Vic., 3220; **(052) 29 2191**
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Model Sports & Hobbies, 33 Station St., Nundah, Qld., 4012; **(07) 266 2260**
Modelcraft Industries International, P.O. Box 471, Hillarys, WA, 6025; **(09) 401 3646**
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Southern Model Supplies, P.O. Box 112, Daw Park, SA, 5041;**(08) 276 7722**
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